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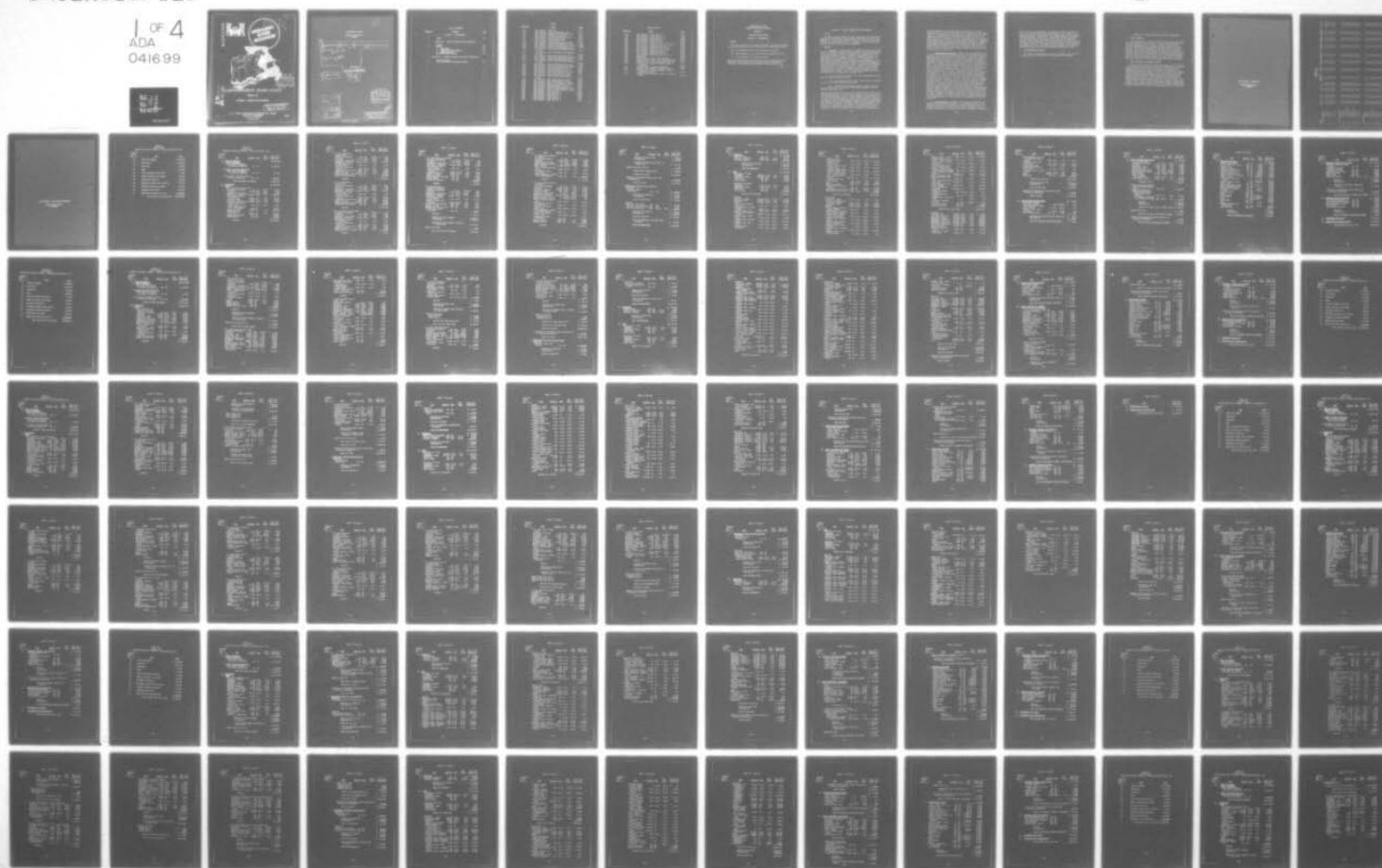
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MERAMEC RIVER, MISSOURI COMPREHENSIVE BASIN STUDY. VOLUME VIII.--ETC(U)
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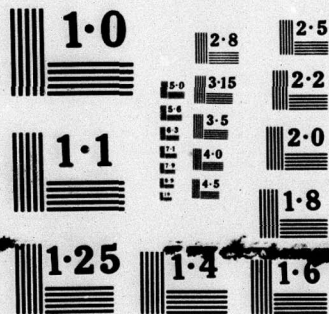
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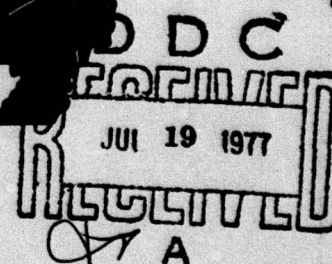
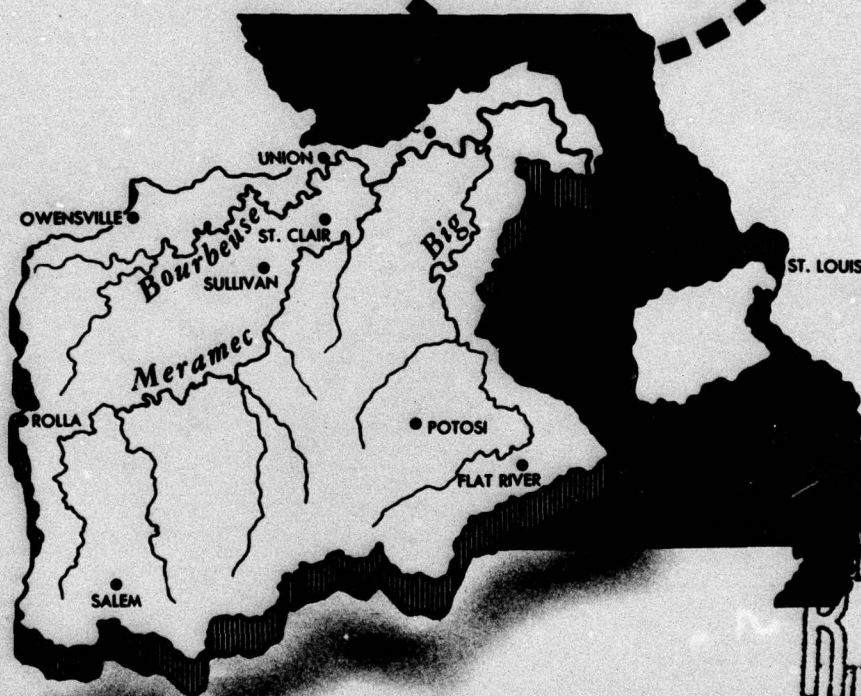
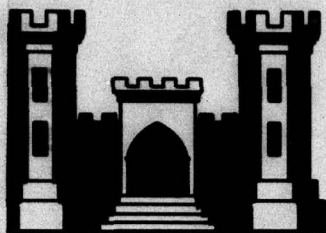
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COMPREHENSIVE BASIN STUDY

VOLUME VIII

APPENDIX T—DETAILED COST ESTIMATES

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COMPREHENSIVE REPORT

MERAMEC RIVER BASIN,
MISSOURI

② Meramec River, Missouri Comprehensive
Basin Study.
Volume VIII.

APPENDIX T.
DETAILED COST ESTIMATES.

⑪ Jan 64

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**COMPREHENSIVE REPORT
MERAMEC RIVER BASIN, MISSOURI**

APPENDIX T

DETAILED COST ESTIMATES

SECTION I - INTRODUCTION

1. SCOPE

The cost estimates for the various elements contained in the basin plan are presented herewith and are divided into three separate parts:

- a. Cost estimates for 31 multiple-purpose reservoirs;
- b. Cost estimates for nine local protection projects; and
- c. Cost estimates for 26 angler-use sites.

Unit costs are based on July 1963 price levels and upon experience on comparable types of work within the general area. Allowances are included for contingencies and maintenance during construction.

SECTION II - BASIS OF DESIGN AND COST ESTIMATES

2. General

The general design concepts and work requirements that are anticipated in the construction of the reservoirs and levees are detailed in APPENDIX E. These design requirements serve as a basis for cost computations that are presented herein. A summation of the design requirements is contained in the following paragraphs.

3. DESIGN

a. Reservoirs. Designs and cost estimates for the 9 main stream reservoirs and the 12 tributary stream reservoirs have been prepared by the St. Louis District Office in accordance with design practices and procedures contained in Corps of Engineers engineering manuals. The basic design and cost estimates for the 12 headwater reservoirs were prepared by the Soil Conservation Service, U. S. Department of Agriculture, and modified by incorporating Corps of Engineers criteria. All estimates have been expanded to include the Federal Government's share of the initial recreational features. Basic data and information for such features as spillway design flood, diversion flows, various reservoir levels for storage requirements, downstream water demands, local protection, and damsite were developed and incorporated in the dam and reservoir designs. The land acquisition program for each of the reservoirs was determined in accordance with:

- (1) The joint Department of the Interior-Department of the Army real estate acquisition policy.
- (2) Project associated mitigation requirements as requested by the U. S. Fish and Wildlife Service, and
- (3) Recreational enhancement requests received from the U. S. Forest Service, the Missouri Conservation Commission, and the Missouri State Park Board.

Reservoir clearing will be required on all lands below an elevation 5 feet above normal pool and will include removal of trees, brush, fences, and existing buildings. Specific areas designated by recreation and fish and wildlife interests would require special clearing. Relocation of roads was based on maintaining service now provided by the existing road network. Missouri State Highway Commission design standards have been observed in all road relocations. Major roads crossing the reservoirs will be relocated to an elevation 3 feet above spillway crest. No railroad alterations or relocations are required at any of the reservoirs. Power and telephone line relocations have been planned so

that the unaffected but isolated areas will continue to be served. Abandoned utility lines will be removed from the reservoir areas. These lines will be evaluated and compensated for by payment to the operating company of an amount equal to the fair value of the facilities. A number of graves in cemeteries are now located within the pool limits of the reservoirs and will have to be moved. Where possible, it is proposed to move these burials to higher ground within the cemeteries. Information available from maps prepared by the Missouri Division of Commerce and Industrial Development of gas and oil pipelines in the State of Missouri indicates four pipelines passing through the basin. It is proposed to alter or relocate those sections of lines where necessary due to location of the reservoirs.

b. Local protection projects. Designs and cost estimates for the nine levee areas have been prepared by the St. Louis District Office in accordance with design practices and procedures as contained in Corps of Engineers engineering manuals. The nine areas selected were assigned levee grades providing protection against floods having a frequency of occurrence of either 50 years or 100 years, as modified by reservoirs affected by backwater from equivalent frequency floods on the Mississippi River. Net levee grades were established with 2 feet of freeboard above the applicable frequency profile. The design of the levee embankment was based on the standard section utilizing selected materials. A cross section consists of a 10-foot wide crown, with an 8-foot wide crushed stone road for inspection, maintenance, and access during floods and emergencies. Closure structures and road crossings were provided as required. In certain areas subject to current attack, provisions were made to place revetment on the riverside slopes. Landside berms were provided where necessary. Pressure relief wells were also provided to insure positive underseepage control. In order to minimize interior drainage problems, creeks would be diverted, where practicable, along back levees. Ditching, ponding, where appropriate, gravity drainage structures, and pumping stations would be provided for removal of interior drainage. Estimates of first costs are based on the assumption that the Federal Government would construct the levees, drainage outlets, closure structures, pumping plants, access roads on top of levees, and railroad alterations as required. Non-Federal interests would furnish all lands, easements, and rights-of-way; bear all property damage costs; provide the necessary interior drainage ditches, except the main ditch at the pumping plants; and bear all costs for relocations of roads and utilities.

c. Angler-use sites. Estimates of first costs are based on the assumption by the Federal Government of all construction costs of the required developments and acquisition of lands and rights-of-way. The 26 angler-use sites were divided into two broad categories - 17 sites having access both by road and water and 9 sites accessible by water only.

The type and scale of development were based on criteria furnished by the U. S. Fish and Wildlife Service, Department of the Interior. All sites would provide sanitary facilities, drinking water, and picnic and camping facilities. In addition to these basic facilities, a parking lot, boat launching ramp, and access road would also be provided at the road access sites. Land acquired for development of these sites generally would be equivalent to a seven-acre plot of land located along the stream. Since all of the angler-use sites depend in part upon low-flow augmentation from a particular upstream reservoir, the sites were combined into groups and each group costed and analyzed as a unit.

4. PRE-AUTHORIZATION STUDIES

The cost of pre-authorization studies is \$565,000. This cost has not been included in the project cost estimates and formulation.

SECTION III - ECONOMIC ANALYSIS AND PROJECT FORMULATION

5. PLANS CONSIDERED

In selecting the best suitable plan for the individual reservoirs, principal consideration was given to a multiple-purpose reservoir for low-flow augmentation in the interest of water quality control, municipal and industrial water supply, general recreation, fish and wildlife conservation, improvement in the basin economy, and flood control. In all cases, consideration was also given to alternative projects capable of serving individual and various combinations of the functions served by the selected plan. The selected multiple-purpose plan for each of the reservoirs provides for a balanced development, and, as a total basin system, combines to produce a scope of development that satisfies the immediate and long-range needs of the basin.

6. COST ALLOCATIONS AND ECONOMIC CHARGES

Project costs have been allocated on the basis of costs contained in this appendix and the benefits contained in APPENDIX R in order to develop benefit-cost ratios for each purpose in each reservoir. Allocations of costs were based on the use of the separable costs-remaining benefits method, which consists of determining the separable costs of including each function in a multiple-purpose project and determining the equitable distribution of joint costs incurred for several purposes in common. These computations were performed by Automatic Data Processing system, Program No. 04-G1-I3-15, and are not in satisfactory form for presentation in this appendix. However, for purposes of this report, there are included as a typical sample computations for Meramec Park Reservoir (#17) and a summary of results showing allocations of first costs and annual charges for each reservoir.

COST ESTIMATE - RESERVOIRS

**MERAMEC RIVER BASIN,
MISSOURI**

TABLE T-1
Meramec River Missouri
Comprehensive Basin Study
Cost summary - Reservoirs

Reservoir No.	Name	01. Lands and damages	02. Relocations	03. Reservoirs	04. Dams	05. Fish and wildlife facilities	06. Roads, railroads and utilities	14. Recreation facilities	19. Buildings, grounds and utilities	20. Permanent operating equipment	30. Engineering and design	31. Supervision and administration	Total project cost
A. MAIN STREAM RESERVOIRS													
2A	Pine Ford	5,960,000	5,653,000	312,000	7,750,000	10,000	364,000	900,000	217,000	176,000	1,670,000	1,170,000	24,200,000
5	Washington Park	1,145,000	2,593,000	138,000	9,705,000	10,000	234,000	120,000	217,000	108,000	1,430,000	1,110,000	16,800,000
9	Irondale	1,910,000	3,570,000	219,000	4,678,000	10,000	342,000	480,000	217,000	153,000	1,130,000	791,000	13,500,000
17	Meramec Park	10,918,000	6,885,000	1,206,000	10,795,000	10,000	163,000	3,150,000	229,000	194,000	2,240,000	1,910,000	37,700,000
27	Salen	1,300,000	2,070,000	177,000	7,871,000	10,000	313,000	460,000	217,000	157,000	1,330,000	995,000	14,900,000
29	Union	6,577,000	4,394,000	750,000	9,395,000	10,000	341,000	750,000	217,000	176,000	1,740,000	1,250,000	25,600,000
40	Virginia Mines	3,915,000	3,219,000	492,000	6,590,000	10,000	407,000	1,000,000	217,000	149,000	1,410,000	991,000	18,400,000
B. TRIBUTARY STREAM RESERVOIRS													
I-14	Huazah Creek	1,130,000	153,000	49,000	3,483,000	3,000	444,000	50,000	181,000	75,000	655,000	417,000	6,640,000
I-15A	Courtois Creek	545,000	430,000	46,000	3,554,000	3,000	787,000	100,000	182,000	74,000	761,000	466,000	6,950,000
I-21	Peavine Creek	265,000	256,000	32,000	1,557,000	3,000	228,000	50,000	182,000	74,000	527,000	266,000	3,440,000
I-23	Little Dry Fork Creek	520,000	236,000	35,000	2,490,000	3,000	127,000	173,000	182,000	74,000	677,000	353,000	4,870,000
I-26	West Fork Huazah Creek	247,000	320,000	32,000	2,308,000	3,000	160,000	50,000	182,000	74,000	578,000	326,000	4,280,000
I-28	Spring Creek	726,000	805,000	63,000	1,536,000	3,000	260,000	160,000	182,000	88,000	632,000	325,000	4,780,000
I-30	Terre Bleue Creek	285,000	336,000	23,000	1,628,000	3,000	110,000	100,000	182,000	82,000	523,000	268,000	3,540,000
I-32	Redosh Creek	814,000	346,000	60,000	1,794,000	3,000	155,000	100,000	182,000	81,000	579,000	296,000	4,410,000
I-33A	Little Bourbouse River	400,000	281,000	40,000	2,742,000	3,000	379,000	50,000	182,000	81,000	621,000	371,000	5,150,000
I-35A	Brush Creek	466,000	580,000	60,000	2,593,000	3,000	168,000	50,000	182,000	81,000	631,000	366,000	5,200,000
I-38	Bourbouse River	725,000	279,000	89,000	2,516,000	3,000	314,000	313,000	194,000	160,000	641,000	376,000	5,610,000
I-41	Benton Creek	167,000	513,000	16,000	1,558,000	3,000	254,000	50,000	182,000	81,000	566,000	290,000	3,680,000
C. HEADWATER RESERVOIRS													
H-3	Dry Creek	161,000	5,000	6,000	124,000	3,000	8,000	25,000	5,000	7,000	46,000	29,000	490,000
H-4	Cabanne Course	178,000	25,000	8,000	337,000	3,000	5,000	25,000	5,000	7,000	104,000	43,000	740,000
H-5A	Brandy Creek	87,000	26,000	8,000	124,000	--	2,000	25,000	5,000	7,000	49,000	29,000	362,000
H-6	Birch Creek	262,000	11,000	6,000	329,000	3,000	8,000	50,000	5,000	7,000	105,000	44,000	830,000
H-8	Little Indian Creek	303,000	24,000	8,000	409,000	3,000	21,000	50,000	5,000	7,000	132,000	58,000	1,020,000
H-9	Bates Creek	136,000	9,000	6,000	240,000	3,000	21,000	25,000	5,000	7,000	79,000	35,000	566,000
H-10A	Lost Creek	79,000	32,000	12,000	201,000	3,000	16,000	25,000	5,000	7,000	75,000	33,000	488,000
H-11A	Winsell Creek	180,000	7,000	4,000	790,000	3,000	4,000	25,000	5,000	7,000	34,000	21,000	379,000
H-12A	Boone Creek	289,000	4,000	14,000	288,000	3,000	2,000	25,000	5,000	7,000	87,000	37,000	761,000
H-25	Big River	162,000	21,000	8,000	209,000	3,000	23,000	25,000	5,000	7,000	75,000	33,000	571,000
H-31	Dry Fork Creek	116,000	30,000	2,000	216,000	3,000	16,000	25,000	5,000	7,000	76,000	34,000	530,000
H-40	Conville Creek	138,000	--	8,000	203,000	--	21,000	25,000	5,000	7,000	67,000	30,000	504,000

COST ESTIMATE - MAIN STREAM RESERVOIRS

**MERAMEC RIVER BASIN,
MISSOURI**

TABLE T-2
Cost estimate
Meramec River Basin, Missouri - Pine Ford Reservoir (2A)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 5,960,000
02	Relocations	5,663,000
03	Reservoirs	312,000
04	Dams	7,758,000
06	Fish and wildlife facilities	10,000
08	Roads, railroads, and bridges	364,000
14	Recreation facilities	900,000
19	Buildings, grounds, and utilities	217,000
20	Permanent operating equipment	176,000
30	Engineering and design	1,670,000
31	Supervision and administration	<u>1,170,000</u>
Total project cost (July 1963)		\$24,200,000

TABLE T-2
Cost estimate
Meramec River Basin, Missouri - Pine Ford Reservoir (2A)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$5,960,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$5,128,000
.2	<u>Bureau of Outdoor Recreation</u>				
	Total lands and damages, including contingencies	sum	job		577,000
.3	<u>Net value of mineral resources, including contingencies</u>	sum	job		<u>255,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$5,960,000
02.	<u>RELOCATIONS</u>				(\$5,663,000)
.1	<u>Roads</u>				
	S-1, State Hwy H at Big River				
	Clearing and grubbing	40	acre	175.00	\$ 7,000
	Stripping	56,300	cu.yd.	0.45	25,335
	Seeding and fertilizing	5	acre	200.00	1,000
	Embankment, compacted	1,470,000	cu.yd.	0.75	1,102,500
	Base material, type I (from quarry)	5,880	ton	4.50	26,460
	Guardrail, steel	14,800	lin.ft.	3.25	48,100
	Bituminous road mix (A-3)	16,900	sq.yd.	0.45	7,605
	Concrete pipe culvert, class V, 48"	400	lin.ft.	21.00	8,400
	Double concrete box cul- vert, 10'x12'x200'	sum	job		38,000
	Riprap (on site)	72,000	ton	3.70	266,400
	Bedding material (on site)	38,800	ton	3.20	124,160
	Bridge over Big River	sum	job		185,000
	Bridge removal	sum	job		<u>7,000</u>
	Subtotal				\$1,846,960

TABLE T-2 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
S-2, State Hwy WW at Maupin Creek					
	Clearing and grubbing	10	acre	175.00	\$ 1,750
	Stripping	16,700	cu. yd.	0.45	7,515
	Seeding and fertilizing	1	acre	200.00	200
	Embankment, compacted	559,000	cu. yd.	0.75	419,250
	Base material, type I (from quarry)	1,400	ton	4.50	6,300
	Guardrail, steel with wood posts	3,000	lin. ft.	3.25	9,750
	Bituminous road mix (A-3)	4,000	sq. yd.	0.45	1,800
	Riprap (on site)	18,800	ton	3.70	69,560
	Bedding material (on site)	10,100	ton	3.20	32,320
	Bridge over Maupin Creek	sum	job		<u>137,000</u>
	Subtotal				\$ 685,445
S-3, State Hwy WW at Ditch Creek					
	Clearing and grubbing	12	acre	175.00	\$ 2,100
	Stripping	19,400	sq. yd.	0.45	8,730
	Seeding and fertilizing	2	acre	200.00	400
	Embankment, compacted	745,000	cu. yd.	0.75	558,750
	Base material, type I (from quarry)	1,680	ton	4.50	7,560
	Guardrail, steel with wood posts	4,000	lin. ft.	3.25	13,000
	Bituminous road mix (A-3)	4,800	sq. yd.	0.45	2,160
	Riprap (on site)	26,000	ton	3.70	96,200
	Bedding material (on site)	14,000	ton	3.20	44,800
	Bridge over Ditch Creek	sum	job		<u>137,000</u>
	Subtotal				\$ 870,700
S-4, State Hwy CC at Big River					
	Clearing and grubbing	5	acre	175.00	\$ 875
	Stripping	7,230	cu. yd.	0.45	3,254
	Seeding and fertilizing	1	acre	200.00	200
	Embankment, compacted	36,400	cu. yd.	0.75	27,300
	Base material, type I (from quarry)	980	ton	4.50	4,410
	Guardrail, steel with wood posts	1,600	lin. ft.	3.25	5,200
	Bituminous road mix (A-3)	2,900	sq. yd.	0.45	1,305
	Riprap (on site)	1,700	ton	3.70	6,290
	Bedding material (on site)	900	ton	3.20	<u>2,880</u>
	Subtotal				\$ 51,714

TABLE T-2 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
S-5, State Hwy 21 at Big River					
	Clearing and grubbing	4	acre	175.00	\$ 700
	Stripping	6,100	cu.yd.	0.45	2,745
	Seeding and fertilizing	1	acre	200.00	200
	Embankment, compacted	30,300	cu.yd.	0.75	22,725
	Base material, type I (from quarry)	980	ton	4.50	4,410
	Guardrail, steel with wood posts	1,400	lin.ft.	3.25	4,550
	Asphaltic concrete	2,900	sq.yd.	2.50	7,250
	Riprap (on site)	1,300	ton	3.70	4,810
	Bedding material (on site)	700	ton	3.20	2,240
	Bridge removal	sum	job		7,000
	Bridge over Big River	sum	job		<u>212,000</u>
	Subtotal				\$ 268,630
S-6, State Hwy 104 in Washington State Park					
	Clearing and grubbing	1	acre	175.00	\$ 175
	Stripping	3,100	cu.yd.	0.45	1,395
	Seeding and fertilizing	1	acre	200.00	200
	Embankment, compacted	50,600	cu.yd.	0.75	37,950
	Base material, type I (from quarry)	4,700	cu.yd.	4.50	21,150
	Guardrail, steel with wood posts	1,400	lin.ft.	3.25	4,550
	Bituminous road mix (A-3)	1,900	sq.yd.	0.45	855
	Riprap (on site)	497	ton	3.70	1,839
	Bedding material (on site)	270	ton	3.20	864
	Concrete box culvert, 5'x10'x200'	sum	job		<u>17,000</u>
	Subtotal				\$ 85,978
	Subtotal for State highways				\$3,809,427
	Contingencies				<u>554,573</u>
	Subtotal for State highways, exclusive of right-of-way				\$4,364,000
	Right-of-way costs				<u>None</u>
	Total cost for State highways				\$4,364,000

TABLE T-2 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
C-1, County Road northeast of Kingston					
	Clearing and grubbing	20	acre	175.00	\$ 3,500
	Stripping	24,300	cu.yd.	0.45	10,935
	Seeding and fertilizing	10	acre	200.00	2,000
	Machine grading, class II	90	station	150.00	13,500
	Fence, removal	18,800	lin.ft.	0.50	9,400
	Fence, 4-strand with wood posts	18,800	lin.ft.	1.75	32,900
	Base material, type I (on site)	7,280	ton	2.00	14,560
	Surface aggregate, crushed stone (from quarry)	2,400	ton	4.50	<u>10,800</u>
	Subtotal				\$ 97,595
C-2, County Road northeast of Kingston					
	Clearing and grubbing	10	acre	175.00	\$ 1,750
	Stripping	23,100	cu.yd.	0.45	10,395
	Excavation (class A)	24,600	cu.yd.	1.00	24,600
	Excavation (rock)	500	cu.yd.	7.50	3,750
	Seeding and fertilizing	6	acre	200.00	1,200
	Embankment, compacted	160,000	cu.yd.	0.75	120,000
	Machine grading, class I	9	station	110.00	990
	Machine grading, class II	2	station	150.00	300
	Fence, 4-strand with wood posts	8,300	lin.ft.	1.75	14,525
	Base material, type II (from quarry)	3,640	ton	4.50	16,380
	Guardrail, steel with wood posts	1,900	lin.ft.	3.25	6,175
	Surface aggregate, crushed stone (from quarry)	1,200	ton	4.50	5,400
	Concrete pipe culvert, class V, 48"	250	lin.ft.	21.00	5,250
	Concrete box culvert, 10'x12'x320'	sum	job		58,000
	Riprap (on site)	2,600	ton	3.70	9,620
	Bedding material	1,400	ton	3.20	<u>4,480</u>
	Subtotal				\$ 282,815

TABLE T-2 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Subtotal for County roads				\$ 380,410
	Contingencies				<u>57,290</u>
	Subtotal for County roads, excl. of right-of-way				\$ 437,700
	Right-of-way costs for C-2				<u>4,300</u>
	Total cost for County roads				\$ 442,000
	Subtotal for roads				\$ 4,806,000
	Operation & maintenance during const. incl. contingencies				<u>66,000</u>
	Total for roads				\$ 4,872,000
.3	<u>Cemeteries, utilities, and structures</u>				
	<u>Cemeteries</u>				
	Cemeteries, grave relocations	sum	job		\$ 500,000
	Subtotal for cemeteries				\$ 500,000
	Contingencies				<u>75,000</u>
	Total for cemeteries				\$ 575,000
	<u>Utilities</u>				
	Power line relocations	sum	job		\$ 85,700
	Telephone line relocations	sum	job		37,500
	Pipe line alterations	4,800	lin.ft.	13.50	<u>64,800</u>
	Subtotal for utilities				\$ 188,000
	Contingencies				<u>28,000</u>
	Total for utilities				\$ 216,000
	Total for cemeteries, utilities, and structures				\$ 791,000
	TOTAL FOR RELOCATIONS				\$ 5,663,000

TABLE T-2 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
03.	RESERVOIRS				(\$ 312,000)
	Bridge removal	sum	job		\$ 14,000
	Clearing, untimbered	2,600	acre	25.00	65,000
	Clearing, timbered	1,100	acre	175.00	192,500
	Subtotal for reservoirs				\$ 271,500
	Contingencies				40,500
	TOTAL FOR RESERVOIRS				\$ 312,000
04.	DAMS				(\$7,758,000)
	Cofferdam, 1st stage				
	Embankment	180,000	cu.yd.	0.55	\$ 99,000
	Embankment removal	180,000	cu.yd.	0.25	45,000
	Unwatering	sum	job		30,000
	Care of water	sum	job		25,000
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		15,000
	Subtotal for cofferdams				\$ 240,000
	Spillway				
	Excavation, common	123,000	cu.yd.	0.45	\$ 55,350
	Excavation, rock	188,000	cu.yd.	4.00	752,000
	Backfill	14,400	cu.yd.	1.25	18,000
	Riprap in exit channel (on site)	4,100	ton	3.70	15,170
	Bedding material in exit channel	2,700	ton	3.20	8,640
	Concrete, mass, fill	6,800	cu.yd.	35.00	238,000
	Concrete, mass, overflow section	10,850	cu.yd.	35.00	379,750
	Concrete, mass, chute walls	1,630	cu.yd.	35.00	57,050
	Concrete, mass, training walls	3,330	cu.yd.	35.00	116,550
	Concrete, mass, wing walls	1,760	cu.yd.	35.00	61,600
	Concrete, reinf., abutments	1,140	cu.yd.	45.00	51,300

TABLE T-2 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Concrete, reinf., approach walls	2,860	cu. yd.	45.00	\$ 128,700
	Concrete, reinf., chute walls	3,120	cu. yd.	45.00	140,400
	Concrete, lightly reinf., chute floor	5,560	cu. yd.	42.00	233,520
	Concrete, lightly reinf., stilling basin floor	5,500	cu. yd.	40.00	220,000
	Concrete, lightly reinf., vert. rock cut facing	2,000	cu. yd.	42.00	84,000
	Steel, concrete rein- forcing	2,380,000	lb.	0.15	357,000
	Drilling 1-1/2" dia. grout holes	950	lin. ft.	4.50	4,275
	Grout	2,000	cu. ft.	5.00	10,000
	Chute floor anchor	8,100	ea.	25.00	202,500
	Vertical rock cut facing anchors	3,000	ea.	27.00	81,000
	Stilling basin floor anchor	800	ea.	39.00	31,200
	Drain holes, 2-1/2" dia.	8,200	lin. ft.	3.00	24,600
	Subtotal for spillway				\$3,270,605
	Outlet Works				
	Excavation, common	21,700	cu. yd.	0.45	\$ 9,765
	Excavation, approach and discharge channels	31,600	cu. yd.	0.50	15,800
	Excavation, rock	3,600	cu. yd.	4.00	14,400
	Backfill	11,500	cu. yd.	1.25	14,375
	Riprap, approach and dis- charge channels	1,100	ton	3.70	4,070
	Bedding material, approach and discharge channels	480	ton	3.20	1,536
	Concrete, mass, bridge piers and abutments	1,100	cu. yd.	35.00	38,500
	Concrete, mass, approach walls	70	cu. yd.	35.00	2,450
	Concrete, reinf., bridge deck and parapets	215	cu. yd.	45.00	9,675
	Concrete, reinf., bridge abutment	7	cu. yd.	45.00	315
	Concrete, reinf., stilling basin	1,050	cu. yd.	45.00	47,250
	Concrete, ballast, in tractor gates	6	cu. yd.	35.00	210

TABLE T-2 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Concrete, reinf., conduit	5,900	cu.yd.	45.00	\$ 265,500
	Concrete, reinf., gate struct. above base slab	3,700	cu.yd.	50.00	185,000
	Concrete, reinf., operat- ing house	150	cu.yd.	60.00	9,000
	Concrete, lightly reinf., gate structure base	460	cu.yd.	45.00	20,700
	Concrete, lightly reinf., bridge piers and abutment	290	cu.yd.	45.00	13,050
	Steel, structural, tractor gates	41,300	lb.	0.35	14,455
	Steel, structural, misc.	19,000	lb.	0.35	6,650
	Steel, structural, bulk- head	13,300	lb.	0.30	3,990
	Steel, structural, bear- ing piles	347,000	lb.	0.12	41,640
	Steel, structural, low- alloy bridges	249,000	lb.	0.40	99,600
	Steel, concrete rein- forcement	1,530,000	lb.	0.15	229,500
	Handrail on bridge, aluminum	868	lin.ft.	2.00	1,736
	Handrail stanchions, aluminum	110	ea.	33.00	3,630
	Windows, steel, industrial, 5'x5'	6	ea.	75.00	450
	Door steel, overhead, 10'x12'	1	ea.	335.00	335
	Tractor gate hoists	sum	job		91,000
	Electrical system	sum	job		91,200
	Subtotal for outlet works				\$1,235,782
Earth Dam					
	Stripping, dam	70,800	cu.yd.	0.45	\$ 31,860
	Stripping, borrow pit	125,000	cu.yd.	0.45	56,250
	Excavation, trench	50,900	cu.yd.	0.50	25,450
	Embankment, impervious	787,000	cu.yd.	0.75	590,250
	Embankment, pervious	617,000	cu.yd.	0.65	401,050
	Embankment, random fill	344,000	cu.yd.	0.70	240,800
	Sand drain (from quarry)	82,400	ton	3.50	288,400
	Riprap (on site)	26,000	ton	3.70	96,200
	Bedding material (on site)	10,800	ton	3.20	34,560
	Gravel on D.S. slope (on site)	12,600	ton	2.70	34,020

TABLE T-2 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
	Road surfacing, A-3, with 10" stone base (from quarry)	4,990	sq.yd.	3.60	\$ 17,964
	Guardrail, steel, with wood posts	4,140	lin.ft.	3.25	13,455
	Site clearing, dam	60	acre	175.00	10,500
	Clearing borrow pit and haul road	30	acre	175.00	5,250
	Drilling 1-1/2" dia. grout holes	16,300	lin.ft.	4.50	73,350
	Grout	19,500	cu.ft.	5.00	97,500
	Piezometers	30	ea.	270.00	8,100
	Subtotal for earth dam				\$2,024,959
	Subtotal for main dam				\$6,771,346
	Contingencies				928,654
	Total for main dam				\$7,700,000
	Operation and maintenance during construction including contingencies				58,000
	TOTAL FOR DAMS				\$7,758,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 10,000)
	Sluice gate, 54"x54", 50' head, complete	3	each	2,660.00	\$ 7,980
	Portable electrical power gate operator	1	each	700.00	700
	Concrete, reinf., gate structure	4	cu.yd.	50.00	200
	Steel, concrete reinf.	600	lb.	0.15	90
	Subtotal for fish and wildlife facilities				\$ 8,970
	Contingencies				1,030
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 10,000

TABLE T-2 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 364,000)
	A-1, new road at dam				
	Clearing and grubbing	20	acre	175.00	\$ 3,500
	Stripping	87,300	cu.yd.	0.45	39,285
	Excavation, class A	15,000	cu.yd.	1.00	15,000
	Excavation, rock	600	cu.yd.	7.50	4,500
	Seeding and fertilizing	10	acre	200.00	2,000
	Machine grading, class I	140	station	110.00	15,400
	Fence removal	20,600	lin.ft.	0.50	10,300
	Fence, 4-strand, with wood posts	23,800	lin.ft.	1.75	41,650
	Base material, type I	11,480	ton	4.50	<u>51,660</u>
	Subtotal for A-1				\$ 183,295
	Local access roads, parking areas, grounds and guard- rails	sum	job		\$ 100,000
	Storage and maintenance, parking and work areas:				
	Crushed stone (from quarry)	3,400	ton	4.50	15,300
	A-2 bituminous surfacing with crushed stone base	4,800	sq.yd.	1.65	<u>7,920</u>
	Subtotal				\$ 306,515
	Contingencies				<u>46,485</u>
	Subtotal for roads, excl. of right-of-way				\$ 353,000
	Right-of-way costs				<u>\$ 7,000</u>
	Subtotal for roads, railroads and bridges				\$ 360,000
	Operation and maintenance during construction, including contingencies				<u>4,000</u>
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$ 364,000

TABLE T-2 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
14.	RECREATION FACILITIES				(\$ 900,000)
	Picnic tables (PT-2)	115	ea.	55.00	\$ 6,325
	Picnic tables (PT-1 conc.)	130	ea.	75.00	9,750
	Concrete pads	200	ea.	150.00	30,000
	Barbecue braziers	245	ea.	65.00	15,925
	Refuse containers (SR-1)	130	ea.	45.00	5,850
	Incinerators (SI-2)	24	ea.	300.00	7,200
	Comfort stations (SC-1)	2	ea.	8,000.00	16,000
	Comfort stations (SC-2) mod.	12	ea.	6,000.00	72,000
	Shelters (PS-1)	5	ea.	2,300.00	11,500
	Central wash house and showers	3	ea.	12,000.00	36,000
	Sewage treatment system	2	ea.	8,000.00	16,000
	Sewage lines	sum	job		10,000
	Wells with pressure tanks	6	ea.	10,000.00	60,000
	Water distribution lines	sum	job		27,100
	Fountains and hydrants	31	ea.	900.00	27,900
	Dry wells	31	ea.	500.00	15,500
	Launching ramps	sum	job		60,000
	Signs	sum	job		7,500
	Parking areas	4.25	acre	15,000.00	63,750
	Access roads	6.50	mile	15,000.00	97,500
	Paths	4	mile	8,000.00	32,000
	Sand blanket	sum	job		82,600
	Trees	200	ea.	30.00	6,000
	Seeding, mulching, and fertilizing	270	acre	160.00	43,200
	Tent camp sites	sum	job		23,000
	Subtotal				\$ 782,600
	Contingencies				117,400
	TOTAL FOR RECREATION FACILITIES				\$ 900,000

TABLE T-2 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
19.	<u>BUILDINGS, GROUNDS AND UTILITIES</u>				(\$ 217,000)
	Equipment storage building, 150'x30'	sum	job		\$ 15,000
	Equipment maintenance building, 100'x30'	sum	job		15,000
	Administration building	sum	job		75,000
	Overlook building	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	5,800
	Subtotal				\$ 148,800
	Contingencies				22,200
	Subtotal for buildings, grounds and utilities				\$ 171,000
	Operation and maintenance during construction including contingencies				\$ 46,000
	TOTAL FOR BUILDINGS, GROUNDS AND UTILITIES				\$ 217,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 176,000)
	Fire fighting equipment	sum	job		\$ 28,200
	Ground maintenance equipment	sum	job		36,750
	Road maintenance equipment	sum	job		17,500
	Shop equipment	sum	job		15,400
	Miscellaneous equipment	sum	job		53,000
	Subtotal				\$ 150,850
	Contingencies				25,150
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 176,000
30.	<u>ENGINEERING AND DESIGN</u>				\$1,670,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$1,170,000
	TOTAL PROJECT COST (July 1963)				\$24,200,000

TABLE T-3
Cost estimate
Meramec River Basin, Missouri - Washington Park Reservoir (5)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 1,145,000
02	Relocations	2,593,000
03	Reservoirs	138,000
04	Dams	9,705,000
06	Fish and wildlife facilities	10,000
08	Roads, railroads, and bridges	234,000
14	Recreation facilities	120,000
19	Buildings; grounds, and utilities	217,000
20	Permanent operating equipment	108,000
30	Engineering and design	1,420,000
31	Supervision and administration	<u>1,110,000</u>
Total project cost (July 1963)		\$16,800,000

TABLE T-3
Cost estimate
Meramec River Basin, Missouri - Washington Park Reservoir (5)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.	<u>LANDS AND DAMAGES</u>				(\$1,145,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 780,000
.2	<u>Bureau of Outdoor Recreation</u>				
	Total lands and damages, including contingencies	sum	job		113,000
.3	Net value of mineral resources, including contingencies	sum	job		<u>252,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$1,145,000
02.	<u>RELOCATIONS</u>				(\$2,593,000)
.1	<u>Roads</u>				
	S-1, State Hwy 47 at Mineral Fork Creek				
	Clearing and grubbing	10	acre	175.00	\$ 1,750
	Stripping	24,300	cu.yd.	0.45	10,935
	Excavation, class A	49,500	cu.yd.	1.00	49,500
	Excavation, rock	4,000	cu.yd.	7.50	30,000
	Seeding and fertilizing	7	acre	200.00	1,400
	Embankment, compacted	17,700	cu.yd.	0.75	13,275
	Machine grading, class I	10	station	110.00	1,100
	Fence, 4-strand with wood posts	10,100	lin.ft.	1.75	17,675
	Base material, type I	3,920	ton	2.00	7,840
	Guardrail, steel with wood posts	800	lin.ft.	3.25	2,600
	Bituminous asphaltic concrete	11,300	sq.yd.	2.50	28,250
	Bridge over Big River	sum	job		21,000
	Bridge over Big River	sum	job		<u>125,000</u>
	Subtotal				\$ 310,325

TABLE T-3 (Cont'd)

<u>Classification No.</u>	<u>Item -</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
S-2, State Hwy "F" at Mineral Fork Creek					
	Clearing and grubbing	3	acre	175.00	\$ 525
	Stripping	19,600	cu.yd.	0.45	8,820
	Seeding and fertilizing	3	acre	200.00	600
	Embankment, compacted	181,000	cu.yd.	0.75	135,750
	Machine grading, class II	13	station	150.00	1,950
	Fence, 4-strand with wood posts	2,500	lin.ft.	1.75	4,375
	Guardrail, steel with wood posts	1,700	lin.ft.	3.25	5,525
	Bituminous road mix (A-3)	3,900	sq.yd.	2.45	9,555
	Riprap	8,800	ton	3.70	32,560
	Bedding material	4,800	ton	3.20	15,360
	Bridge removal	sum	job		2,000
	Bridge over Mineral Fork	sum	job		32,000
	Subtotal				\$ 249,020
	Subtotal for State highways				\$ 559,345
	Contingencies				83,455
	Subtotal for State highways, exclusive of right-of-way				\$ 642,800
	Right-of-way costs for S-1				10,200
	Total cost for State highways				\$ 653,000
C-1, County Hwy M at Clear Creek					
	Clearing and grubbing	50	acre	175.00	\$ 8,750
	Stripping	86,000	cu.yd.	0.45	38,700
	Excavation, class A	51,200	cu.yd.	1.00	51,200
	Excavation, rock	31,800	cu.yd.	7.50	238,500
	Seeding and fertilizing	30	acre	200.00	6,000
	Embankment, compacted	48,900	cu.yd.	0.75	36,675
	Overhaul	80,000	sta.yd.	0.03	2,400
	Machine grading, class I	290	station	110.00	31,900
	Machine grading, class II	30	station	150.00	4,500
	Fence removal	71,000	lin.ft.	0.50	35,500
	Fence, 4-strand with wood posts	71,000	lin.ft.	1.75	124,250

TABLE T-3 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Base material, type II	2,940	ton	2.50	\$ 7,350
	Guardrail, steel with wood posts	2,700	lin.ft.	3.25	8,775
	Surface aggregate, crushed stone	2,940	ton	2.70	7,938
	Concrete double box cul- vert, 6'x15'x150'	sum	job		11,000
	Bridge over Clear Creek	sum	job		42,000
	Subtotal				\$ 655,438
C-2, East and West Road at Rogue Creek					
	Clearing and grubbing	1	acre	175.00	175
	Stripping	9,270	cu.yd.	0.45	4,172
	Excavation, class A	5,100	cu.yd.	1.00	5,100
	Excavation, rock	1,600	cu.yd.	7.50	12,000
	Seeding and fertilizing	4	acre	200.00	800
	Embankment, compacted	87,500	cu.yd.	0.75	65,625
	Machine grading, class I	10	station	110.00	1,100
	Machine grading, class II	7	station	150.00	1,050
	Fence, 4-strand with wood posts	3,400	lin.ft.	1.75	5,950
	Base material, type II (on site)	1,540	ton	2.50	3,850
	Guardrail, steel with wood posts	2,600	lin.ft.	3.25	8,450
	Surface aggregate, crushed stone (on site)	1,540	ton	2.70	4,158
	Riprap (on site)	8,700	ton	3.70	32,190
	Bedding material, (on site)	4,700	ton	3.20	15,040
	Concrete double box cul- vert, 5'x16'x150'	sum	job		12,000
	Concrete double box cul- vert, 5'x20'x175'	sum	job		13,000
	Bridge removal	sum	job		3,500
	Subtotal				\$ 188,160

TABLE T-3 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
C-3, North of Reservoir near Clifton School					
	Stripping	730	cu.yd.	0.45	329
	Embankment, compacted	4,500	cu.yd.	0.75	3,375
	Base material, type I (on site)	80	ton	2.00	160
	Guardrail, steel with wood posts	160	lin.ft.	3.25	520
	Concrete pipe culvert, class V (60")	100	lin.ft.	40.00	4,000
	Subtotal				\$ 8,384
	Subtotal for County roads				\$ 851,982
	Contingencies				128,218
	Subtotal for County roads, exclusive of right-of-way				\$ 980,200
Right-of-way costs:					
	County road C-1				\$ 17,000
	County road C-2				2,800
	Subtotal for right-of-way costs				\$ 19,800
	Total cost for County roads				\$1,000,000
A-2, North from State Hwy 21					
	Clearing and grubbing	10	acre	175.00	\$ 1,750
	Stripping	2,670	cu.yd.	0.45	1,202
	Seeding and fertilizing	10	acre	200.00	2,000
	Machine grading, class I	70	station	110.00	7,700
	Machine grading, class II	50	station	150.00	7,500
	Fence removal	24,200	lin.ft.	0.50	12,100
	Fence, 4-strand with wood posts	24,200	lin.ft.	1.75	42,350
	Base material, type I (on site)	5,040	ton	2.00	10,080
	Subtotal				\$ 84,682

TABLE T-3 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	A-3, North from County Road west of Old Mines				
	Clearing and grubbing	20	acre	175.00	\$ 3,500
	Seeding and fertilizing	20	acre	200.00	4,000
	Machine grading, class I	120	station	110.00	13,200
	Machine grading, class II	30	station	150.00	4,500
	Fence removal	27,200	lin.ft.	0.50	13,600
	Fence, 4-strand with wood posts	27,200	lin.ft.	1.75	47,600
	Base material, type I (on site)	6,580	ton	2.00	<u>13,160</u>
	Subtotal				\$ 99,560
	Subtotal for Township roads				\$ 184,242
	Contingencies				<u>27,558</u>
	Subtotal for Township roads, exclusive of right-of-way				\$ 211,800
	Right-of-way costs:				
	Township road A-2				7,200
	Township road A-3				<u>12,000</u>
	Subtotal for right-of-way costs				\$ 19,200
	Total cost for Township roads				\$ 231,000
	Subtotal for roads				\$1,884,000
	Operation and maintenance during construction, including contingencies				
					<u>\$ 92,000</u>
	Total for roads				\$1,976,000
.3	<u>Cemeteries, Utilities, and Structures</u>				
	<u>Cemeteries</u>				
	Cemeteries, grave relo- cations	sum	job		<u>\$ 500,000</u>
	Subtotal for cemeteries				\$ 500,000
	Contingencies				<u>75,000</u>
	Total for cemeteries				\$ 575,000

TABLE T-3 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Utilities				
	Power line relocations	sum	job		\$ 24,000
	Telephone line reloca- tions	sum	job		<u>12,500</u>
	Subtotal for utilities				\$ 36,500
	Contingencies				<u>5,500</u>
	Total for utilities				\$ 42,000
	Total for cemeteries, utilities and structures				\$ 617,000
	TOTAL FOR RELOCATIONS				\$2,593,000
03.	<u>RESERVOIRS</u>				(\$ 138,000)
	Bridge removal	sum	job		\$ 5,000
	Clearing, untimbered	1,100	acre	25.00	27,500
	Clearing, timbered	500	acre	175.00	<u>87,500</u>
	Subtotal for reservoirs				\$ 120,000
	Contingencies				<u>18,000</u>
	TOTAL FOR RESERVOIRS				\$ 138,000
04.	<u>DAMS</u>				(\$9,705,000)
	Cofferdam, 1st stage				
	Embankment	47,500	cu.yd.	0.55	\$ 26,125
	Embankment removal	47,500	cu.yd.	0.25	11,875
	Unwatering	sum	job		35,000
	Care of water	sum	job		30,000
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		<u>15,000</u>
	Subtotal for cofferdams				\$ 144,000

TABLE T-3 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Spillway				
	Excavation, common	181,000	cu.yd.	0.45	\$ 81,450
	Excavation, rock	251,000	cu.yd.	4.00	1,004,000
	Backfill	10,300	cu.yd.	1.25	12,875
	Bedding material in exit channel	2,700	ton	3.20	8,640
	Riprap in exit channel	4,100	ton	3.70	15,170
	Concrete, mass, overflow section	7,700	cu.yd.	35.00	269,500
	Concrete, mass, fill	26,000	cu.yd.	35.00	910,000
	Concrete, mass, abutments	140	cu.yd.	35.00	4,900
	Concrete, mass, approach walls	10	cu.yd.	35.00	350
	Concrete, mass, chute walls	940	cu.yd.	35.00	32,900
	Concrete, mass, training walls	1,400	cu.yd.	35.00	49,000
	Concrete, mass, wing walls	790	cu.yd.	35.00	27,650
	Concrete, reinf. abutments	240	cu.yd.	45.00	10,800
	Concrete, reinf., approach walls	3,200	cu.yd.	45.00	144,000
	Concrete, reinf., chute walls	1,030	cu.yd.	45.00	46,350
	Concrete, reinf. lightly, chute floor	6,600	cu.yd.	42.00	277,200
	Concrete, reinf. lightly, vert. rock cut facing	1,600	cu.yd.	42.00	67,200
	Concrete, reinf., lightly, stilling basin floor	4,500	cu.yd.	40.00	180,000
	Steel, concrete rein- forcing	1,930,000	lb.	0.15	289,500
	Chute floor anchor	9,400	ea.	25.00	235,000
	Vertical rock cut facing anchor	2,400	ea.	27.00	64,800
	Stilling basin floor anchor	650	ea.	39.00	25,350
	Drain holes, 2-1/2" dia.	9,500	lin.ft.	3.00	28,500
	Drilling 1-1/2" dia. grout holes	700	lin.ft.	4.50	3,150
	Grout	700	cu.ft.	5.00	3,500
	Subtotal for spillway				\$3,791,785

TABLE T-3 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Outlet works				
	Excavation, common	14,200	cu. yd.	0.45	\$ 6,390
	Excavation, approach and discharge channels	9,000	cu. yd.	0.50	4,500
	Excavation, rock	1,140	cu. yd.	4.00	4,560
	Backfill	10,100	cu. yd.	1.25	12,625
	Riprap, approach and discharge channels	800	ton	3.70	2,960
	Bedding material, approach and discharge channels	350	ton	3.20	1,120
	Concrete, mass, bridge piers and abutments	1,100	cu. yd.	35.00	38,500
	Concrete, mass, approach walls	50	cu. yd.	35.00	1,750
	Concrete, ballast, in tractor gates	1	cu. yd.	35.00	35
	Concrete, reinf., bridge deck and parapets	190	cu. yd.	45.00	8,550
	Concrete, reinf., bridge abutment	7	cu. yd.	45.00	315
	Concrete, reinf., stilling basin	340	cu. yd.	45.00	15,300
	Concrete, reinf., conduit	1,700	cu. yd.	45.00	76,500
	Concrete, reinf., gate struc- ture above base slab	2,160	cu. yd.	50.00	108,000
	Concrete, reinf., operating house	90	cu. yd.	60.00	5,400
	Concrete, lightly reinf., gate structure base	150	cu. yd.	45.00	6,750
	Concrete, lightly reinf., bridge piers and abutment	290	cu. yd.	45.00	13,050
	Steel, structural, tractor gates	8,800	lb.	0.35	3,080
	Steel, structural, misc.	20,000	lb.	0.35	7,000
	Steel, structural, bulk- head	3,570	lb.	0.30	1,071
	Steel, structural, bearing piles	381,000	lb.	0.12	45,720
	Steel, structural, low- alloy bridges	180,000	lb.	0.40	72,000
	Steel, concrete rein- forcement	626,000	lb.	0.15	93,900
	Handrail on bridge, aluminum	750	lin. ft.	2.00	1,500
	Handrail stanchions, aluminum	100	ea.	33.00	3,300

TABLE T-3 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
	Windows, steel, industrial, 5'x5'	6	ea.	75.00	\$ 450
	Door, steel, overhead, 10'x12'	1	ea.	335.00	335
	Tractor gate hoists	sum	job		60,000
	Electrical system	sum	job		<u>33,200</u>
	Subtotal for outlet works				\$ 627,861
	Earth dam				
	Stripping, dam	117,000	cu.yd.	0.45	\$ 52,650
	Stripping, borrow pit	353,000	cu.yd.	0.45	158,850
	Excavation, trench	87,000	cu.yd.	0.50	43,500
	Embankment, impervious	466,000	cu.yd.	0.75	349,500
	Embankment, pervious	2,790,000	cu.yd.	0.65	1,813,500
	Embankment, random fill	1,460,000	cu.yd.	0.70	1,022,000
	Piezometers	42	ea.	270.00	11,340
	Riprap	37,000	ton	3.70	136,900
	Bedding material	15,400	ton	3.20	49,280
	Seeding and fertilizing	20	acre	200.00	4,000
	Road surfacing, with 10" stone base	6,690	sq.yd.	3.00	20,070
	Guardrail, steel with wood posts	5,020	lin.ft.	3.25	16,315
	Site clearing, dam	90	acre	175.00	15,750
	Clearing, borrow pit and haul road	80	acre	175.00	14,000
	Spillway embankment	2,700	cu.yd.	0.60	1,620
	Riprap on spillway embankment	1,200	ton	3.70	4,440
	Bedding material on spillway embankment	790	ton	3.20	2,528
	Drilling 1-1/2" dia. grout holes	20,000	lin.ft.	4.50	90,000
	Grout	20,000	cu.ft.	5.00	<u>100,000</u>
	Subtotal for earth dam				\$3,906,243
	Subtotal for main dam				\$8,469,889
	Contingencies				<u>1,160,111</u>
	Total for main dam				\$9,630,000
	Operation and maintenance during construction, including contingencies				<u>75,000</u>
	TOTAL FOR DAMS				\$9,705,000

TABLE T-3 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 10,000)
	Sluice gate, 54"x54", 50' head, complete	3	each	\$2,660.00	\$ 7,980
	Portable electrical power gate operator	1	each	700.00	700
	Concrete, reinf., gate structure	4	cu.yd.	50.00	200
	Steel, concrete reinf.	600	lb.	0.15	90
	Subtotal for fish and wildlife facilities				\$ 8,970
	Contingencies				1,030
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 10,000
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 234,000)
	A-1, North from State Highway 21 & 47 Intersection across dam				
	Clearing and grubbing	9	acre	175.00	\$ 1,575
	Stripping	6,770	cu.yd.	0.45	3,047
	Excavation, class A	17,100	cu.yd.	1.00	17,100
	Excavation, rock	1,200	cu.yd.	7.50	9,000
	Seeding and fertilizing	7	acre	200.00	1,400
	Embankment, compacted	5,100	cu.yd.	0.75	3,825
	Machine grading, class I	30	station	110.00	3,300
	Fence, 4-strand wire with wood posts	10,800	lin.ft.	1.75	18,900
	Base material, type I (on site)	620	ton	2.00	1,240
	Guardrail, steel with wood posts	5,000	lin.ft.	3.25	16,250
	Concrete pipe culvert, class V, 54"	50	lin.ft.	30.00	1,500
	Subtotal for A-1				\$ 77,137
	Local access roads, parking areas, grounds and guardrails	sum	job		\$ 100,000
	Storage and maintenance park- ing and work areas:				
	Crushed stone	3,400	ton	2.00	6,800
	A-2 bituminous surfacing with crushed stone base	4,800	sq.yd.	1.65	7,920
	Subtotal				\$ 191,857
	Contingencies				29,143
	Subtotal for roads, exclusive of right-of-way				\$ 221,000

TABLE T-3 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Right-of-way costs				\$ 7,000
	Subtotal for roads, railroads and bridges				\$ 228,000
	Operation and maintenance during construction, including contingencies				6,000
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$ 234,000
14.	RECREATION FACILITIES				(\$ 120,000)
	Picnic tables (PT-2)	20	ea.	55.00	\$ 1,100
	Picnic tables (PT-1 conc.)	20	ea.	75.00	1,500
	Concrete pads	30	ea.	150.00	4,500
	Barbecue braziers	40	ea.	65.00	2,600
	Refuse containers (SR-1)	15	ea.	45.00	675
	Incinerators (SI-2)	3	ea.	300.00	900
	Comfort stations (SC-2) mod.	2	ea.	6,000.00	12,000
	Shelters (PS-1)	1	ea.	2,300.00	2,300
	Wells with pressure tanks	1	ea.	10,000.00	10,000
	Water distribution lines	sum	job		3,100
	Fountains and hydrants	4	ea.	900.00	3,600
	Dry wells	4	ea.	500.00	2,000
	Launching ramps	sum	job		30,000
	Signs	sum	job		1,000
	Parking areas	0.5	acre	15,000.00	7,500
	Access roads	0.5	mile	15,000.00	7,500
	Paths	0.5	mile	8,000.00	4,000
	Sand blanket	sum	job		2,525
	Trees	10	ea.	30.00	300
	Seeding, mulching and fertilizing	20	acre	160.00	3,200
	Tent camp sites	sum	job		4,000
	Subtotal				\$ 104,300
	Contingencies				15,700
	TOTAL FOR RECREATION FACILITIES				\$ 120,000

TABLE T-3 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
19.	<u>BUILDINGS, GROUNDS AND UTILITIES</u>				(\$ 217,000)
	Equipment storage building 150'x30'	sum	job		\$ 15,000
	Equipment maintenance building 100'x30'	sum	job		15,000
	Administration building	sum	job		75,000
	Overlook building	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	5,800
	Subtotal				\$ 148,800
	Contingencies				22,200
	Subtotal for buildings, grounds and utilities				\$ 171,000
	Operation and maintenance during construction including contingencies				\$ 46,000
	TOTAL FOR BUILDINGS, GROUNDS AND UTILITIES				\$ 217,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 108,000)
	Fire fighting equipment	sum	job		\$ 19,200
	Ground maintenance equipment	sum	job		20,250
	Shop equipment	sum	job		10,850
	Miscellaneous equipment	sum	job		43,725
	Subtotal				\$ 94,025
	Contingencies				13,975
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 108,000
30.	<u>ENGINEERING AND DESIGN</u>				\$1,420,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$1,110,000
	TOTAL PROJECT COST (July 1963)				\$16,800,000

TABLE T-4
Cost estimate
Meramec River Basin, Missouri - Irondale Reservoir (9)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 1,910,000
02	Relocations	3,570,000
03	Reservoirs	219,000
04	Dams	4,678,000
06	Fish and wildlife facilities	10,000
08	Roads, railroads, and bridges	342,000
14	Recreation facilities	480,000
19	Buildings, grounds, and utilities	217,000
20	Permanent operating equipment	153,000
30	Engineering and design	1,130,000
31	Supervision and administration	<u>791,000</u>
Total project cost (July 1963)		\$13,500,000

TABLE T-4
Cost estimate
Meramec River Basin, Missouri - Irondale Reservoir (9)

<u>Classification</u> <u>No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$1,910,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$1,562,000
.2	<u>Bureau of Outdoor Recreation</u>				
	Total lands and damages, including contingencies	sum	job		93,000
.3	<u>Net value of mineral resources, including contingencies</u>	sum	job		<u>255,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$1,910,000
02.	<u>RELOCATIONS</u>				(\$3,570,000)
.1	<u>Roads</u>				
	S-1, State Hwy 21 north from Hwy M				
	Clearing and grubbing	30	acre	175.00	\$ 5,250
	Stripping	66,200	cu.yd.	0.45	29,790
	Excavation, Class A	68,600	cu.yd.	1.00	68,600
	Excavation, rock	18,900	cu.yd.	7.50	141,750
	Seeding and fertilizing	20	acre	200.00	4,000
	Embankment, compacted	602,000	cu.yd.	0.75	451,500
	Machine grading, class I	50	station	110.00	5,500
	Machine grading, class II	20	station	150.00	3,000
	Fence, 4-strand with wood posts	23,400	lin.ft.	1.75	40,950
	Base material, type I	12,900	ton	4.50	58,050
	Guardrail, steel with wood posts	5,100	lin.ft.	3.25	16,575
	Bituminous asphaltic concrete	36,900	sq.yd.	2.50	92,250
	Concrete pipe, culvert, class IV, 60"	90	lin.ft.	40.00	3,600
	Riprap	15,300	ton	3.70	56,610
	Bedding material	8,250	ton	3.20	26,400
	Bridge removal	sum	job		5,000
	Bridge over Big River	sum	job		<u>141,000</u>
	Subtotal				\$1,149,825

TABLE T-4 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
S-2, State Hwy 32 at Lost and Cedar Creeks					
	Stripping	32,600	cu.yd.	0.45	\$ 14,670
	Seeding and fertilizing	3	acre	200.00	600
	Embankment, compacted	528,000	cu.yd.	0.75	396,000
	Fence removal	8,800	lin.ft.	0.50	4,400
	Fence, 4-strand, with wood posts	8,800	lin.ft.	1.75	15,400
	Base material, type I	3,360	ton	4.50	15,120
	Guardrail, steel, with wood posts	7,600	lin.ft.	3.25	24,700
	Bituminous asphaltic con- crete	10,000	sq.yd.	2.50	25,000
	Riprap	21,800	ton	3.70	80,660
	Bedding material	11,800	ton	3.20	37,760
	Bridge removal (2)	sum	job		20,000
	Bridge over Lost Creek	sum	job		91,000
	Bridge over Cedar Creek	sum	job		120,000
	Subtotal				\$ 845,310
S-3, State Hwy M near Hwy V Intersection					
	Clearing and grubbing	40	acre	175.00	\$ 7,000
	Stripping	46,400	cu.yd.	0.45	20,880
	Excavation	43,200	cu.yd.	1.00	43,200
	Seeding and fertilizing	30	acre	200.00	6,000
	Embankment, compacted	17,400	cu.yd.	0.75	13,050
	Machine grading, class I	140	station	110.00	15,400
	Machine grading, class II	40	station	150.00	6,000
	Fence removal	30,800	lin.ft.	0.50	15,400
	Fence, 4-strand with wood posts	48,000	lin.ft.	1.75	84,000
	Base material, type I	18,600	ton	4.50	83,700
	Guardrail, steel with wood posts	1,250	lin.ft.	3.25	4,063
	Bituminous road mix (A-3)	53,300	sq.yd.	0.45	23,985
	Concrete culvert pipe (60")	350	lin.ft.	40.00	14,000
	Subtotal				\$ 336,678

TABLE T-4 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Subtotal for State highways				\$2,331,813
	Contingencies				<u>349,387</u>
	Subtotal for State highways, exclusive of right-of-way				\$2,681,200
	Right-of-way costs:				
	State highway S-1				45,000
	State highway S-3				<u>16,800</u>
	Subtotal for right-of-way costs				\$ 61,800
	Total cost for State highways				\$2,743,000
	C-1, Southeast over Waller Creek				
	Clearing and grubbing	4	acre	175.00	\$ 700
	Stripping	1,500	cu.yd.	0.45	675
	Seeding and fertilizing	3	acre	200.00	600
	Machine grading, class I	4	station	110.00	440
	Machine grading, class II	20	station	150.00	3,000
	Fence, 4-strand with wood posts	4,600	lin.ft.	1.75	8,050
	Base material, type II	3,640	ton	4.50	16,380
	Surface aggregate, crushed stone	2,800	ton	2.70	7,560
	Bridge over Waller Creek	sum	job		<u>17,000</u>
	Subtotal for County roads				\$ 54,405
	Contingencies				<u>8,595</u>
	Subtotal for County roads, exclusive of right-of-way				\$ 63,000
	Right-of-way costs for C-1				<u>3,000</u>
	Total cost for County roads				\$ 66,000

TABLE T-4 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
A-2,	Access Road near Cedar Creek Arm				
	Clearing and grubbing	4	acre	175.00	\$ 700
	Stripping	2,400	cu.yd.	0.45	1,080
	Seeding and fertilizing	8	acre	200.00	1,600
	Reshaping	1	mile	1,700.00	1,700
	Machine grading, class II	20	station	150.00	3,000
	Fence removal	13,200	lin.ft.	0.50	6,600
	Fence, 4-strand, with wood posts	13,200	lin.ft.	1.75	23,100
	Base material, type I	5,180	ton	4.50	23,310
	Aggregate, crushed stone	5,180	ton	4.50	<u>23,310</u>
	Subtotal for Township roads				\$ 84,400
	Contingencies				<u>12,600</u>
	Subtotal for Township roads, exclusive of right-of-way				\$ 97,000
	Right-of-way cost for A-2				<u>3,000</u>
	Total cost for Township roads				\$ 100,000
	Subtotal for roads				\$2,909,000
	Operation and maintenance during construction, including contingencies				<u>59,000</u>
	Total for roads				\$2,968,000
.3	<u>Cemeteries, Utilities and Structures</u>				
	<u>Cemeteries</u>				
	Cemeteries, grave relocations	sum	job		\$ <u>500,000</u>
	Subtotal for cemeteries				\$ 500,000
	Contingencies				<u>75,000</u>
	Total for cemeteries				\$ 575,000

TABLE T-4 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
	Utilities				
	Power line relocations	sum	job		\$ 15,400
	Telephone line relocations	sum	job		<u>8,100</u>
	Subtotal for utilities				\$ 23,500
	Contingencies				<u>3,500</u>
	Total for utilities				\$ 27,000
	Total for cemeteries, utilities and structures				602,000
	TOTAL FOR RELOCATIONS				\$3,570,000
03.	<u>RESERVOIRS</u>				(\$ 219,000)
	Bridge removal (3 bridges)	sum	job		\$ 25,500
	Clearing, untimbered	1,700	acre	25.00	42,500
	Clearing, timbered	700	acre	175.00	<u>122,500</u>
	Subtotal for reservoirs				\$ 190,500
	Contingencies				<u>28,500</u>
	TOTAL FOR RESERVOIRS				\$ 219,000
04.	<u>DAMS</u>				(\$4,678,000)
	Cofferdam, 1st stage				
	Embankment	467,300	cu.yd.	0.55	\$ 257,015
	Embankment removal	467,300	cu.yd.	0.25	116,825
	Unwatering	sum	job		30,000
	Care of water	sum	job		<u>25,000</u>
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		<u>15,000</u>
	Subtotal for cofferdams				\$ 469,840

TABLE T-4 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Spillway				
	Excavation, common	108,000	cu. yd.	0.45	\$ 48,600
	Excavation, rock	56,300	cu. yd.	4.00	225,200
	Backfill	9,800	cu. yd.	1.25	12,250
	Riprap in exit channel	4,100	ton	3.70	15,170
	Bedding material in exit channel	2,700	ton	3.20	8,640
	Concrete, mass overflow section	3,820	cu. yd.	35.00	133,700
	Concrete, mass, approach walls	480	cu. yd.	35.00	16,800
	Concrete, mass, chute walls	1,300	cu. yd.	35.00	45,500
	Concrete, mass training walls	1,120	cu. yd.	35.00	39,200
	Concrete, mass wing walls	930	cu. yd.	35.00	32,550
	Concrete, reinf., abutments	310	cu. yd.	45.00	13,950
	Concrete, reinf., approach walls	380	cu. yd.	45.00	17,100
	Concrete, reinf., chute walls	830	cu. yd.	45.00	37,350
	Concrete, lightly reinf. chute floor	5,300	cu. yd.	42.00	222,600
	Concrete, lightly reinf., stilling basin floor	3,820	cu. yd.	40.00	152,800
	Concrete, lightly reinf., vert. rock cut facing	700	cu. yd.	42.00	29,400
	Steel, concrete rein- forcing	1,210,000	lb.	0.15	181,500
	Chute floor anchor	7,650	ea.	25.00	191,250
	Vertical rock cut facing anchors	1,030	ea.	27.00	27,810
	Stilling basin floor anchor	550	ea.	39.00	21,450
	Drain holes, 2-1/2" dia.	7,950	lin. ft.	3.00	23,850
	Drilling 1-1/2" dia. grout holes	600	lin. ft.	4.50	2,700
	Grout	600	cu. ft.	5.00	3,000
	Subtotal for spillway				\$1,502,370

TABLE T-4 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Outlet works				
	Excavation, common	10,900	cu. yd.	0.45	\$ 4,905
	Excavation, approach and discharge channels	9,100	cu. yd.	0.50	4,550
	Excavation, rock	1,000	cu. yd.	4.00	4,000
	Backfill	7,700	cu. yd.	1.25	9,625
	Riprap, approach and discharge channels	800	ton	3.70	2,960
	Bedding material, approach and discharge channels	350	ton	3.20	1,120
	Concrete, mass bridge piers and abutments	360	cu. yd.	35.00	12,600
	Concrete, mass, approach walls	70	cu. yd.	35.00	2,450
	Concrete, ballast, in tractor gates	1	cu. yd.	35.00	35
	Concrete, reinf. bridge deck and parapets	160	cu. yd.	45.00	7,200
	Concrete, reinf., bridge abutment	7	cu. yd.	45.00	315
	Concrete, reinf., stilling basin	350	cu. yd.	45.00	15,750
	Concrete, reinf. conduit	1,220	cu. yd.	45.00	54,900
	Concrete, reinf., gate structure above base slab	1,900	cu. yd.	50.00	95,000
	Concrete, reinf., operating house	90	cu. yd.	60.00	5,400
	Concrete, lightly reinf., gate structure base	150	cu. yd.	45.00	6,750
	Concrete, lightly reinf., bridge piers and abutment	110	cu. yd.	45.00	4,950
	Steel, structural, tractor gates	7,600	lb.	0.35	2,660
	Steel, structural, misc.	17,300	lb.	0.35	6,055
	Steel, structural, bulkhead	3,050	lb.	0.30	915
	Steel, structural, bearing piles	124,000	lb.	0.12	14,880

TABLE T-4 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Steel, structural, low- alloy, bridges	170,000	lb.	0.40	\$ 68,000
	Steel, concrete reinf.	492,000	lb.	0.15	73,800
	Handrail on bridge, aluminum	650	lin.ft.	2.00	1,300
	Handrail stanchions, aluminum	80	ea.	33.00	2,640
	Windows, steel, industrial, 5'x5'	6	ea.	75.00	450
	Door, steel, overhead, 10'x12'	1	ea.	335.00	335
	Tractor gate hoists	sum	job		115,000
	Electrical system	sum	job		<u>77,000</u>
	Subtotal for outlet works				\$ 595,545
	Earth dam				
	Stripping, dam	78,800	cu.yd.	0.45	\$ 35,460
	Stripping, borrow pit	166,000	cu.yd.	0.45	74,700
	Excavation, trench	none	cu.yd.	-	-
	Embankment, impervious	423,000	cu.yd.	0.75	317,250
	Embankment, pervious	551,000	cu.yd.	0.65	358,150
	Embankment, random fill	299,000	cu.yd.	0.70	209,300
	Sand drain	none	tons	-	-
	Gravel toe drain	none	tons	-	-
	Riprap	35,800	tons	3.70	132,460
	Bedding material	14,900	tons	3.20	47,680
	Gravel on D.S. slope	12,900	tons	4.50	58,050
	Seeding	none	acres	-	-
	Road surfacing, A-3, with 10" stone base	10,300	sq.yd.	3.60	37,080
	Guardrail, steel, with wood posts	7,700	lin.ft.	3.25	25,025
	Site clearing	80	acres	175.00	14,000
	Clearing, borrow pit and haul road	40	acres	175.00	7,000
	Drilling, 1-1/2" dia. grout holes	8,700	lin.ft.	4.50	39,150
	Grout	8,700	cu.ft.	5.00	43,500
	Piezometers	60	ea.	270.00	<u>16,200</u>
	Subtotal for earth dam				\$1,415,005

TABLE T-4 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Subtotal for main dam				\$3,982,760
	Contingencies				<u>597,240</u>
	Total for main dam				\$4,580,000
	Operation and maintenance during construction, including contingencies				<u>98,000</u>
	TOTAL FOR DAMS				\$4,678,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 10,000)
	Sluice gate, 54"x54", 50'				
	head, complete	3	each	2,660.00	\$ 7,980
	Portable electrical power				
	gate operator	1	each	700.00	700
	Concrete, reinf., gate				
	structure	4	cu.yd.	50.00	200
	Steel, concrete reinf.	600	lb.	0.15	<u>90</u>
	Subtotal for fish and wildlife facilities				\$ 8,970
	Contingencies				<u>1,030</u>
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 10,000
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 342,000)
	A-1, South over dam to Hwy. M				
	Clearing and grubbing	10	acre	175.00	\$ 1,750
	Stripping	5,670	cu.yd.	0.45	2,552
	Excavation, class A	30,800	cu.yd.	1.00	30,800
	Excavation, rock	2,200	cu.yd.	7.50	16,500
	Seeding and fertilizing	7	acre	200.00	1,400
	Embankment, compacted	61,200	cu.yd.	0.75	45,900
	Overhaul	178,000	sta.yd.	0.03	5,340
	Machine grading, class I	20	station	110.00	2,200
	Fence, 4-strand, with				
	posts	10,000	lin.ft.	1.75	17,500
	Base material, type I	4,060	ton	4.50	18,270
	Guardrail, steel, with				
	wood posts	2,200	lin.ft.	3.25	7,150
	Surface aggregate,				
	crushed stone	4,060	ton	4.50	<u>18,270</u>
	Subtotal for A-1				\$ 167,632

TABLE T-4 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Local access roads, parking areas, grounds, and guardrail	sum	job		\$ 100,000
	Storage and maintenance parking and working areas:				
	Crushed stone	3,400	tons	4.50	15,300
	A-2 bituminous surfacing with crushed stone base	4,800	sq.yd.	1.65	<u>7,920</u>
	Subtotal				\$ 290,852
	Contingencies				<u>43,148</u>
	Subtotal for roads, exclusive of right-of-way				\$ 334,000
	Right-of-way cost				<u>4,000</u>
	Subtotal for roads, railroads, and bridges				\$ 338,000
	Operation and maintenance during construction, including contingencies				<u>4,000</u>
	TOTAL FOR ROADS, RAILROADS, AND BRIDGES				\$ 342,000
14.	<u>RECREATION FACILITIES</u>				(\$ 480,000)
	Picnic tables (PT-2)	60	ea.	55.00	\$ 3,300
	Picnic tables (PT-1 conc.)	70	ea.	75.00	5,250
	Concrete pads	100	ea.	150.00	15,000
	Barbecue braziers	130	ea.	65.00	8,450
	Refuse containers (SR-1)	70	ea.	45.00	3,150
	Incinerators (SI-2)	13	ea.	300.00	3,900
	Comfort stations (SC-1)	1	ea.	8,000.00	8,000
	Comfort stations (SC-2) mod.	6	ea.	6,000.00	36,000
	Shelters (PS-1)	3	ea.	2,300.00	6,900
	Central wash house and showers	2	ea.	12,000.00	24,000
	Sewage treatment system	1	ea.	8,000.00	8,000
	Sewage lines	sum	job		5,300
	Wells with pressure tanks	3	ea.	10,000.00	30,000
	Water distribution lines	sum	job		14,500
	Fountains and hydrants	16	ea.	900.00	14,400
	Dry wells	16	ea.	500.00	8,000
	Launching ramps	sum	job		40,000
	Signs	sum	job		4,000

TABLE T-4 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Parking areas	2.25	acre	15,000.00	\$ 33,750
	Access roads	3.50	mile	15,000.00	52,500
	Paths	2	mile	8,000.00	16,000
	Sand blanket	sum	job		39,300
	Trees	110	ea.	30.00	3,300
	Seeding, mulching and fertilizing	140	acre	160.00	22,400
	Tent camp sites	sum	job		12,000
	Subtotal				\$ 417,400
	Contingencies				62,600
	TOTAL FOR RECREATION FACILITIES				\$ 480,000
19.	<u>BUILDINGS, GROUNDS, AND UTILITIES</u>				(\$ 217,000)
	Equipment storage building 150'x30'	sum	job		\$ 15,000
	Equipment maintenance building, 100'x30'	sum	job		15,000
	Administration building	sum	job		75,000
	Overlook building	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	5,800
	Subtotal				\$ 148,800
	Contingencies				22,200
	Subtotal for buildings, grounds and utilities				\$ 171,000
	Operation and maintenance during construction, including contingencies				46,000
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 217,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 153,000)
	Fire fighting equipment	sum	job		\$ 28,200
	Ground maintenance equipment	sum	job		25,750
	Road maintenance equipment	sum	job		17,500
	Shop equipment	sum	job		10,950
	Miscellaneous equipment	sum	job		50,825
	Subtotal				\$ 133,225
	Contingencies				19,775
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 153,000

TABLE T-4 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Total esti- mated cost</u>
30.	<u>ENGINEERING AND DESIGN</u>	\$ 1,130,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>	\$ 791,000
TOTAL PROJECT COST (July 1963)		\$13,500,000

TABLE T-5
Cost estimate
Meramec River Basin, Missouri - Meramec Park Reservoir (17)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$10,918,000
02	Relocations	6,885,000
03	Reservoirs	1,206,000
04	Dams	10,795,000
06	Fish and wildlife facilities	10,000
08	Roads, railroads, and bridges	163,000
14	Recreation facilities	3,150,000
19	Buildings, grounds, and utilities	229,000
20	Permanent operating equipment	194,000
30	Engineering and design	2,240,000
31	Supervision and administration	<u>1,910,000</u>
Total project cost (July 1963)		\$37,700,000

TABLE T-5
Cost estimate
Meramec River Basin, Missouri - Meramec Park Reservoir (17)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$10,918,000)
.1	<u>Corps of Engineers</u>				
	Total lands & damages including contingencies	sum	job		\$10,114,000
.2	<u>Bureau of Outdoor Recreation</u>				
	Total of lands & damages including contingencies	sum	job		769,000
.3	Net value of mineral resources including contingencies	sum	job		<u>35,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$10,918,000
02.	<u>RELOCATIONS</u>				(\$ 6,885,000)
.1	<u>Roads</u>				
	S-1, State Hwy N from Bourbon, Mo. to Anthonies Mill				
	Clearing and grubbing	100	acre	175.00	\$ 17,500
	Stripping	133,000	cu.yd.	0.45	59,850
	Excavation, class A	87,800	cu.yd.	1.00	87,800
	Excavation, rock	9,300	cu.yd.	7.50	69,750
	Seeding & fertilizing	60	acre	200.00	12,000
	Embankment, compacted	1,760,000	cu.yd.	0.75	1,320,000
	Machine grading, class I	130	station	110.00	14,300
	Machine grading, class II	300	station	150.00	45,000
	Fence removal	13,000	lin.ft.	0.50	6,500
	Fence, 4-strand w/wood posts	27,000	lin.ft.	1.75	47,250
	Base material, type I	37,100	ton	2.00	74,200
	Guardrail, steel w/wood posts	4,600	lin.ft.	3.25	14,950
	Bituminous road mix (A-3)	106,000	sq.yd.	0.45	47,700
	Concrete box culvert, 9'x9'x60'	sum	job		4,000
	Riprap	34,600	ton	3.70	128,020
	Bedding material	18,700	ton	3.20	59,840
	Bridge over Meramec River	sum	job		<u>204,000</u>
	Subtotal				\$ 2,212,660

TABLE T-5 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
S-2, State Hwy 8 @ Huzzah Creek					
	Clearing and grubbing	5	acre	175.00	\$ 875
	Stripping	8,300	cu.yd.	0.45	3,735
	Seeding & fertilizing	1	acre	200.00	200
	Embankment & compaction	89,500	cu.yd.	0.75	67,125
	Base material, type I	1,280	ton	2.00	2,560
	Guardrail, steel w/wood posts	2,400	lin.ft.	3.25	7,800
	Bituminous road mix (A-3)	3,600	sq.yd.	0.45	1,620
	Riprap	3,200	ton	3.70	11,840
	Bedding material	1,700	ton	3.20	5,440
	Bridge over Huzzah Creek	sum	job		257,000
	Bridge removal over Huzzah Creek	sum	job		<u>10,000</u>
	Subtotal				\$ 368,195
S-3, State Hwy D @ State Creek					
	Clearing and grubbing	5	acre	175.00	\$ 875
	Stripping	8,630	cu.yd.	0.45	3,884
	Seeding & fertilizing	1	acre	200.00	200
	Embankment, compacted	75,900	cu.yd.	0.75	56,925
	Fence removal	3,100	lin.ft.	0.50	1,550
	Base material, type I	1,200	ton	2.00	2,400
	Guardrail, steel w/wood posts	2,900	lin.ft.	3.25	9,425
	Surface aggregate, crushed stone	1,200	ton	2.70	3,240
	Concrete box culvert, 10'x20'x150'	sum	job		19,000
	Riprap	2,800	ton	3.70	10,360
	Bedding material	1,500	ton	3.20	4,800
	Bridge removal	sum	job		<u>5,000</u>
	Subtotal				\$ 117,659

TABLE T-5 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
S-4, State Hwy east Haack Cemetery					
	Clearing & grubbing	8	acre	175.00	\$ 1,400
	Stripping	42,500	cu.yd.	0.45	19,125
	Seeding & fertilizing	2	acre	200.00	400
	Embankment, compacted	47,800	cu.yd.	0.75	35,850
	Fence removal	5,000	lin.ft.	0.50	2,500
	Base material, type II	1,960	ton	2.50	4,900
	Guardrail, steel w/wood posts	4,800	lin.ft.	3.25	15,600
	Surface aggregate, crushed stone	650	ton	2.70	1,755
	Concrete box culvert, 10'x15'x120'	sum	job		22,000
	Riprap	2,000	ton	3.70	7,400
	Bedding material	1,100	ton	3.20	3,520
	Subtotal				\$ 114,450
	Subtotal for State highways				\$ 2,812,964
	Contingencies				413,036
	Subtotal for State highways, excl. of right-of-way				\$ 3,226,000
	Right-of-way costs for S-1				\$ 85,000
	Total cost for State highways				\$ 3,311,000
C-1, County Road west of Avery Hollow					
	Clearing & grubbing	7	acre	175.00	\$ 1,225
	Stripping	13,900	cu.yd.	0.45	6,255
	Excavation, class A	6,400	cu.yd.	1.00	6,400
	Seeding & fertilizing	4	acre	200.00	800
	Embankment, compacted	209,000	cu.yd.	0.75	156,750
	Machine grading, class I	7	station	110.00	770
	Fence, 4-strand w/wood posts	3,600	lin.ft.	1.75	6,300
	Base material, type II	2,660	ton	2.50	6,650
	Guardrail, steel w/wood posts	2,400	lin.ft.	3.25	7,800
	Surface aggregate, crushed stone	900	ton	2.70	2,430
	Riprap	6,400	ton	3.70	23,680
	Bedding material	3,500	ton	3.20	11,200
	Bridge over Meramec River	sum	job		132,000
	Subtotal				\$ 362,260

TABLE T-5 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
C-2, County Road d north of Carter Creek					
	Clearing & grubbing	6	acre	175.00	\$ 1,050
	Stripping	9,330	cu.yd.	0.45	4,199
	Seeding & fertilizing	4	acre	200.00	800
	Machine grading, class II	40	station	150.00	6,000
	Fence, 4-strand w/wood posts	7,200	lin.ft.	1.75	12,600
	Base material, type II	2,800	ton	2.50	7,000
	Surface aggregate, crushed stone	900	cu.yd.	2.70	2,430
	Concrete pipe culvert, class V, 72"	60	lin.ft.	47.00	<u>2,820</u>
	Subtotal				\$ 36,899
C-3, County Road north of Greens Creek					
	Clearing & grubbing	23	acre	175.00	\$ 4,025
	Stripping	28,400	cu.yd.	0.45	12,780
	Excavation, class A	7,300	cu.yd.	1.00	7,300
	Seeding & fertilizing	4	acre	200.00	800
	Machine grading, class I	192	station	110.00	21,120
	Fence, 4-strand w/wood posts	19,200	lin.ft.	1.75	33,600
	Base material, type II	13,900	ton	2.50	34,750
	Surface aggregate, crushed stone	4,680	ton	2.70	<u>12,636</u>
	Subtotal				\$ 127,011
C-4, County Road west of Whittenberg Creek					
	Clearing & grubbing	7	acre	175.00	\$ 1,225
	Stripping	12,000	cu.yd.	0.45	5,400
	Seeding & fertilizing	2	acre	200.00	400
	Embankment, compacted	37,000	cu.yd.	0.75	27,750
	Fence removal	4,300	lin.ft.	0.50	2,150
	Base material, type II	1,680	ton	2.50	4,200
	Guardrail, steel w/wood posts	1,400	lin.ft.	3.25	4,550
	Surface aggregate, crushed stone	400	ton	2.70	1,080
	Concrete box culvert 5'x20'x60'	sum	job		13,000
	Riprap	960	ton	3.70	3,552
	Bedding material	520	ton	3.20	<u>1,664</u>
	Subtotal				\$ 64,971

TABLE T-5 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
C-5, County Road near Henpeck Hollow					
	Clearing & grubbing	10	acre	175.00	\$ 1,750
	Stripping	17,600	cu.yd.	0.45	7,920
	Seeding & fertilizing	3	acre	200.00	600
	Embankment, compacted	66,700	cu.yd.	0.75	50,025
	Machine grading, class II	10	station	150.00	1,500
	Fence removal	8,300	lin.ft.	.50	4,150
	Base material, type II	1,820	ton	2.50	4,550
	Guardrail, steel w/wood posts	2,900	lin.ft.	3.25	9,425
	Surface aggregate, crushed stone	590	ton	2.70	1,593
	Concrete box culvert 10'x10'x60'	sum	job		9,000
	Riprap	3,000	ton	3.70	11,100
	Bedding material	1,600	ton	3.20	5,120
	Bridge over Courtois Creek	sum	job		75,000
	Subtotal				\$ 181,733
C-6, County Road south of State Highway N					
	Clearing & grubbing	9	acre	175.00	\$ 1,575
	Stripping	13,700	cu.yd.	0.45	6,165
	Seeding & fertilizing	2	acre	200.00	400
	Embankment, compacted	353,000	cu.yd.	0.75	264,750
	Machine grading, class II	3	station	150.00	450
	Fence removal	5,200	lin.ft.	0.50	2,600
	Base material, type II	1,960	ton	2.50	4,900
	Guardrail, steel w/wood posts	4,400	lin.ft.	3.25	14,300
	Surface aggregate, crushed stone	670	ton	2.70	1,809
	Concrete box culvert 10'x10'x300'	sum	job		32,000
	Riprap	5,400	ton	3.70	19,980
	Bedding material	2,900	ton	3.20	9,280
	Subtotal				\$ 358,209

TABLE T-5 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
C-7, County Road over Hinch Branch					
	Clearing & grubbing	7	acre	175.00	\$ 1,225
	Stripping	10,700	cu.yd.	0.45	4,815
	Seeding & fertilizing	2	acre	200.00	400
	Embankment, compacted	238,000	cu.yd.	0.75	178,500
	Fence removal	3,800	lin.ft.	0.50	1,900
	Base material, type II	1,540	ton	2.50	3,850
	Guardrail, steel w/wood posts	3,600	lin.ft.	3.25	11,700
	Surface aggregate, crushed stone	490	ton	2.70	1,323
	Concrete box culvert 10'x20'x300'	sum	job		52,000
	Riprap	6,200	ton	3.70	22,940
	Bedding material	3,400	ton	3.20	10,880
	Subtotal				\$ 289,533
C-8, County Road south of Anthonies Mill					
	Clearing & grubbing	26	acre	175.00	\$ 4,550
	Stripping	13,200	cu.yd.	0.45	5,940
	Seeding & fertilizing	15	acre	200.00	3,000
	Excavation, class A	26,100	cu.yd.	1.00	26,100
	Excavation, rock	5,600	cu.yd.	7.50	42,000
	Embankment, compacted	138,900	cu.yd.	0.75	104,175
	Fence, 4-strand w/wood posts	14,000	lin.ft.	1.75	24,500
	Base material, type I	10,100	ton	2.50	25,250
	Guardrail, steel	2,300	lin.ft.	3.25	7,475
	Surface aggregate, crushed stone	3,380	ton	2.70	9,126
	Machine grading, class I	90	station	110.00	9,900
	Machine grading, class II	30	station	150.00	4,500
	Bridge, 20'x100'	sum	job		25,000
	Subtotal				\$ 291,516

TABLE T-5 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
C-9, County Road @ Ashley Branch					
	Clearing and grubbing	20	acre	175.00	\$ 3,500
	Stripping	26,600	cu.yd.	0.45	11,970
	Excavation, class A	54,100	cu.yd.	1.00	54,100
	Excavation, rock	1,400	cu.yd.	7.50	10,500
	Seeding & fertilizing	10	acre	200.00	2,000
	Embankment, compacted	10,800	cu.yd.	0.75	8,100
	Machine grading, class I	40	station	110.00	4,400
	Machine grading, class II	9	station	150.00	1,350
	Fence, 4-strand w/wood posts	11,460	lin.ft.	1.75	20,055
	Base material, type II	5,100	cu.yd.	2.50	12,750
	Guardrail, steel w/wood posts	400	lin.ft.	3.25	1,300
	Surface aggregate, crushed stone	2,300	ton	2.70	6,210
	Concrete box culvert 10'x20'x60'	sum	job		<u>13,000</u>
	Subtotal				\$ 149,235
	Subtotal for County roads				\$ 1,861,367
	Contingencies				<u>272,633</u>
	Subtotal for County roads, excl. of right-of-way				\$ 2,134,000
	Right-of-way costs for C-1				\$ 4,500
	Right-of-way costs for C-2				5,500
	Right-of-way costs for C-9				<u>12,000</u>
	Subtotal for right-of-way costs				\$ 22,000
	Total cost for County roads				\$ 2,156,000
A-2, east and west from Pea Ridge Road					
	Cleaning & grubbing	30	acre	175.00	\$ 5,250
	Stripping	47,200	cu.yd.	0.45	21,240
	Seeding & fertilizing	10	acre	200.00	2,000
	Machine grading, class I	180	station	110.00	19,800
	Base material, type I	14,100	ton	2.00	28,200
	Fence, 4-strand w/wood posts	3,960	lin.ft.	1.75	<u>6,930</u>
	Subtotal				\$ 83,420

TABLE T-5 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
A-3, north and south @ Courtois Creek					
	Clearing & grubbing	30	acre	175.00	\$ 5,250
	Stripping	39,800	cu.yd.	0.45	17,910
	Excavation, class A	12,100	cu.yd.	1.00	12,100
	Excavation, rock	2,900	cu.yd.	7.50	21,750
	Seeding & fertilizing	20	acre	200.00	4,000
	Embankment, compacted	18,100	cu.yd.	0.75	13,575
	Machine grading, class I	110	station	110.00	12,100
	Machine grading, class II	40	station	150.00	6,000
	Fence removal	3,640	lin.ft.	0.50	1,820
	Fence, 4-strand w/wood posts	3,640	lin.ft.	1.75	6,370
	Base material, type I	13,000	ton	2.00	26,000
	Guardrail, steel w/wood posts	600	lin.ft.	3.25	<u>1,950</u>
	Subtotal				\$ 128,825
	Subtotal for Township roads				\$ 212,245
	Contingencies				<u>31,755</u>
	Subtotal for Township roads, excl. of right-of-way				\$ 244,000
Right-of-way costs:					
	Township road A-2				\$ 20,000
	Township road A-3				<u>11,000</u>
	Subtotal for right-of-way costs				\$ 31,000
	Total cost for Township roads				\$ 275,000
	Subtotal for roads				\$ 5,742,000
	Operation and maintenance during construction, including contingencies				<u>97,000</u>
	Total for roads				\$ 5,839,000

TABLE T-5 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
.3	<u>Cemeteries, Utilities, and Structures</u>				
	<u>Cemeteries</u>				
	Cemeteries, grave relocations	sum	job		\$ 500,000
	Subtotal for cemeteries				\$ 500,000
	Contingencies				75,000
	Total for cemeteries				\$ 575,000
	<u>Utilities</u>				
	Power line relocations	sum	job		\$ 214,100
	Telephone line relocations	sum	job		94,400
	<u>Pipeline alterations</u>				
	under Huzzah Creek	3,000	lin.ft.	13.50	40,500
	under Courtois Creek	4,500	lin.ft.	13.50	60,750
	Subtotal for utilities				\$ 409,750
	Contingencies				61,250
	Total for utilities				\$ 471,000
	Total for cemeteries, utilities, and structures				\$ 1,046,000
	TOTAL FOR RELOCATIONS				\$ 6,885,000
03.	<u>RESERVOIRS</u>				(\$ 1,206,000)
	Bridge Removals	sum	job		\$ 19,000
	Clearing, untimbered	7,600	acre	25.00	190,000
	Clearing, timbered	4,800	acre	175.00	840,000
	Subtotal for reservoirs				\$ 1,049,000
	Contingencies				157,000
	TOTAL FOR RESERVOIRS				\$ 1,206,000

TABLE T-5 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
04.	<u>DAMS</u>				(\$10,795,000)
	Cofferdam, 1st stage				
	Embankment	330,000	cu.yd.	0.55	\$ 181,500
	Embankment removal	330,000	cy.yd.	0.25	82,500
	Unwatering	sum	job		35,000
	Care of water	sum	job		30,000
	Cofferdam, 2nd stage				
	Embankment	11,100	cu.yd.	0.55	6,105
	Embankment removal	11,100	cu.yd.	0.25	2,775
	Unwatering	sum	job		20,000
	Care of water	sum	job		15,000
	Subtotal for cofferdams				\$ 372,880
	Spillway				
	Excavation, common	110,000	cu.yd.	0.45	\$ 49,500
	Excavation, rock	171,000	cu.yd.	4.00	684,000
	Backfill	18,600	cu.yd.	1.25	23,250
	Riprap in exit channel	4,100	ton	3.70	15,170
	Bedding material in exit channel	2,700	ton	3.20	8,640
	Concrete, mass, overflow section	8,640	cu.yd.	35.00	302,400
	Concrete, mass, fill	6,800	cu.yd.	35.00	238,000
	Concrete, mass, abutments	550	cu.yd.	35.00	19,250
	Concrete, mass, approach walls	230	cu.yd.	35.00	8,050
	Concrete, mass, chute walls	650	cu.yd.	35.00	22,750
	Concrete, mass, training walls	3,700	cu.yd.	35.00	129,500
	Concrete, mass, wing walls	1,700	cu.yd.	35.00	59,500
	Concrete, reinf., abutments	340	cu.yd.	45.00	15,300
	Concrete, reinf., approach walls	5,070	cu.yd.	45.00	228,150
	Concrete, reinf., chute walls	1,020	cu.yd.	45.00	45,900
	Concrete, lightly reinf., chute floor	6,300	cu.yd.	42.00	264,600
	Concrete, lightly reinf., stilling basin floor	5,080	cu.yd.	40.00	203,200
	Concrete, lightly reinf., vert. rock cut facing	2,480	cu.yd.	42.00	104,160

TABLE T-5 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Spillway (cont'd)				
	Steel, concrete reinforcing	2,350,000	lb.	0.15	\$ 352,500
	Drilling 1-1/2" dia. grout holes	800	lin.ft.	4.50	3,600
	Grout	800	cu.ft.	5.00	4,000
	Chute floor anchor	9,300	ea.	25.00	232,500
	Vertical rock cut facing anchors	3,800	ea.	27.00	102,600
	Stilling basin floor anchor	720	ea.	39.00	28,080
	Drain holes, 2-1/2" dia.	9,400	lin.ft.	3.00	28,200
	Spillway bridge				<u>65,439</u>
	Subtotal for spillway				\$ 3,238,239
	Outlet works				
	Excavation, common	50,800	cu.yd.	0.45	\$ 22,860
	Excavation, approach & discharge channels	58,600	cu.yd.	0.50	29,300
	Excavation, rock	6,700	cu.yd.	4.00	26,800
	Backfill	24,000	cu.yd.	1.25	30,000
	Riprap, approach & dis- charge channels	1,880	ton	3.70	6,956
	Bedding material, approach & discharge channels	800	ton	3.20	2,560
	Concrete, mass, bridge piers & abutments	1,230	cu.yd.	35.00	43,050
	Concrete, mass, approach walls	230	cu.yd.	35.00	8,050
	Concrete, ballast in tractor gates	13	cu.yd.	35.00	455
	Concrete, reinf., bridge deck & parapets	200	cu.yd.	45.00	9,000
	Concrete, reinf., bridge abutment	6	cu.yd.	45.00	270
	Concrete, reinf., stilling basin	1,670	cu.yd.	45.00	75,150
	Concrete, reinf., conduit	11,080	cu.yd.	45.00	498,600
	Concrete, reinf., gate structure above base slab	6,330	cu.yd.	50.00	316,500
	Concrete, reinf., operating house	210	cu.yd.	60.00	12,600
	Concrete, lightly reinf., gate structure base	840	cu.yd.	45.00	37,800

TABLE T-5 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
Outlet works (cont'd)					
	Concrete, lightly reinf., bridge piers & abutment	290	cu.yd.	45.00	\$ 13,050
	Steel, structural, tractor gates	89,400	lb.	0.35	31,290
	Steel, structural, bulkhead	4,050	lb.	0.30	1,215
	Steel, structural., misc.	23,100	lb.	0.35	8,085
	Steel, structural, bearing piles	450,000	lb.	0.12	54,000
	Steel, structural, low- alloy bridges	255,000	lb.	0.40	102,000
	Steel, concrete reinforcement	2,730,000	lb.	0.15	409,500
	Handrail on bridge, aluminum	950	lin.ft.	2.00	1,900
	Handrail stanchions, aluminum	120	ea.	33.00	3,960
	Windows, steel, industrial, 5'x5'	6	ea.	75.00	450
	Door, steel, overhead, 10'x12'	1	ea.	335.00	335
	Tractor gate hoists	sum	job		123,000
	Electrical system	sum	job		35,000
	Subtotal for outlet works				\$ 1,903,736

TABLE T-5 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Earth dam				
	Stripping, dam	97,300	cu.yd.	0.45	\$ 43,785
	Stripping, borrow pit	312,000	cu.yd.	0.45	140,400
	Excavation, trench	59,900	cu.yd.	0.50	29,950
	Embankment, impervious	2,330,000	cu.yd.	0.75	1,747,500
	Embankment, pervious	936,000	cu.yd.	0.65	608,400
	Embankment, random fill	-	-	-	-
	Sand drain	96,200	ton	1.75	168,350
	Gravel toe drain	17,600	ton	2.50	44,000
	Riprap	30,000	ton	3.70	111,000
	Bedding material	11,200	ton	3.20	35,840
	Gravel on downstream slope	16,500	ton	2.70	44,550
	Seeding	-	-	-	-
	Road surfacing, A-3, w/10" stone base	6,270	sq.yd.	3.00	18,810
	Guardrail, steel w/wood posts	4,700	lin.ft.	3.25	15,275
	Site clearing, dam	70	acre	175.00	12,250
	Clearing, borrow pit & haul road	30	acre	175.00	5,250
	Spillway embankment	5,140	cu.yd.	0.60	3,084
	Riprap, spillway embankment	1,060	ton	3.70	3,922
	Bedding material embankment	690	ton	3.20	2,208
	Drilling 1-1/2" dia. grout holes	80,200	lin.ft.	4.50	360,900
	Grout	80,200	cu.ft.	5.00	401,000
	Piezometer	39	ea.	270.00	10,530
	Subtotal for earth dam				\$ 3,807,004
	Subtotal for main dam				\$ 9,321,859
	Contingencies				<u>1,398,141</u>
	Total for main dam				\$10,720,000
	Operation and maintenance during construction, including contingencies				<u>75,000</u>
	TOTAL FOR DAMS				\$10,795,000

TABLE T-5 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 10,000)
	Sluice gate, 54"x54", 50' head, complete	3	ea.	2,660.00	\$ 7,980
	Portable electrical power gate operator	1	ea.	700.00	700
	Concrete, reinf., gate structure	4	cu.yd.	50.00	200
	Steel, concrete reinf.	600	lb.	0.15	90
	Subtotal for fish and wildlife facilities			\$	8,970
	Contingencies				1,030
	TOTAL FOR FISH AND WILDLIFE FACILITIES			\$	10,000
08.	<u>ROADS, RAILROADS, AND BRIDGES</u>				(\$ 163,000)
	A-1, Access road to dam Caseyville				
	Clearing and grubbing	2	acre	175.00	\$ 350
	Stripping	3,360	cu.yd.	0.45	1,512
	Seeding & fertilizing	3	acre	200.00	600
	Machine grading, class II	30	station	150.00	4,500
	Base material, type I	2,380	ton	2.00	4,760
	Bituminous road mix (A-3)	6,100	sq.yd.	0.45	2,745
	Subtotal for A-1			\$	14,467
	Local access roads, parking areas, grounds & guardrails sum job			\$	100,000
	Storage & maintenance, parking & work areas:				
	Crushed stone	3,400	ton	2.70	\$ 9,180
	A-2 bituminous surfacing w/crushed stone base	4,800	sq.yd.	1.65	7,920
	Subtotal			\$	131,567
	Contingencies				19,433
	Subtotal for roads, exclusive of right-of-way			\$	151,000
	Right-of-way costs				10,000
	Subtotal for roads, railroads, and bridges			\$	161,000
	Operation and maintenance during construction, including contingencies				2,000
	TOTAL FOR ROADS, RAILROADS, AND BRIDGES			\$	163,000

TABLE T-5 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
14.	<u>RECREATION FACILITIES</u>				(\$ 3,150,000)
	Picnic tables (PT-2)	400	ea.	55.00	\$ 22,000
	Picnic tables (PT-1 conc.)	450	ea.	75.00	33,750
	Concrete pads	450	ea.	150.00	67,500
	Barbecue braziers	850	ea.	65.00	55,250
	Refuse containers (SR-1)	450	ea.	45.00	20,250
	Incinerators (SI-2)	85	ea.	300.00	25,500
	Comfort stations (SC-1)	4	ea.	8,000.00	32,000
	Comfort stations (SC-2) mod.	45	ea.	6,000.00	270,000
	Shelters (PS-1)	17	ea.	2,300.00	39,100
	Central wash house & showers	12	ea.	12,000.00	144,000
	Sewage treatment system	6	ea.	8,000.00	48,000
	Sewage lines	sum	job		35,000
	Wells w/pressure tanks	21	ea.	10,000.00	210,000
	Water distribution lines	sum	job		95,000
	Fountains & hydrants	110	ea.	900.00	99,000
	Dry wells	110	ea.	500.00	55,000
	Launching ramps	sum	job		240,000
	Signs	sum	job		10,000
	Parking areas	15	acre	15,000.00	225,000
	Access roads	23	mile	15,000.00	345,000
	Paths	15	mile	8,000.00	120,000
	Sand blanket	sum	job		251,750
	Trees	800	ea.	30.00	24,000
	Seeding, mulching, & fertilizing	1,200	acre	160.00	192,000
	Tent camp sites	sum	job		80,000
	Subtotal				\$ 2,739,100
	Contingencies				410,900
	TOTAL FOR RECREATION FACILITIES				\$ 3,150,000

TABLE T-5 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
19.	<u>BUILDINGS, GROUNDS, AND UTILITIES</u>				(\$ 229,000)
	Equipment storage bldg. (150'x30')	sum	job		\$ 15,000
	Equipment maintenance bldg. (100'x30')	sum	job		15,000
	Administration building	sum	job		75,000
	Overlook building	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	5,800
	Subtotal				\$ 148,800
	Contingencies				22,200
	Subtotal for buildings, grounds, and utilities				\$ 171,000
	Operation and maintenance during construction, including contingencies				58,000
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 229,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 194,000)
	Fire fighting equipment	sum	job		28,200
	Ground maintenance equipment	sum	job		39,250
	Road maintenance equipment	sum	job		17,250
	Shop equipment	sum	job		18,400
	Miscellaneous equipment	sum	job		65,500
	Subtotal				\$ 168,600
	Contingencies				25,400
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 194,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 2,240,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				1,910,000
	TOTAL PROJECT COST (July 1963)				\$37,700,000

TABLE T-6
Cost estimate
Meramec River Basin, Missouri - Salem Reservoir (27)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01-	Lands and damages	\$ 1,300,000
02	Relocations	2,070,000
03	Reservoirs	177,000
04	Dams	7,871,000
06	Fish and wildlife facilities	10,000
08	Roads, railroads, and bridges	313,000
14	Recreation facilities	460,000
19	Buildings, grounds, and utilities	217,000
20	Permanent operating equipment	157,000
30	Engineering and design	1,330,000
31	Supervision and administration	<u>995,000</u>
Total project cost (July 1963)		\$14,900,000

TABLE T-6
Cost estimate
Meramec River Basin, Missouri - Salem Reservoir (27)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.	<u>LANDS AND DAMAGES</u>				(\$ 1,300,000)
.1	<u>Corps of Engineers</u>				
	Total lands & damages, including contingencies	sum	job		\$ 1,150,000
.2	<u>Bureau of Outdoor Recreation</u>				
	Total lands & damages, including contingencies	sum	job		<u>150,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 1,300,000
02.	<u>RELOCATIONS</u>				(\$ 2,070,000)
.1	<u>Roads</u>				
	S-1, west at Highway No. 19				
	Clearing & grubbing	40	acre	175.00	\$ 7,000
	Stripping	58,300	cu.yd.	0.45	26,235
	Excavation, class A	46,700	cu.yd.	1.00	46,700
	Excavation, rock	3,700	cu.yd.	7.50	27,750
	Seeding & fertilizing	20	acre	200.00	4,000
	Embankment, compacted	732,000	cu.yd.	0.75	549,000
	Machine grading, class I	120	station	110.00	13,200
	Fence, 4-strand w/wood posts	30,600	lin.ft.	1.75	53,550
	Base material, type I (from quarry)	14,400	ton	3.00	43,200
	Guardrail, steel w/wood posts	4,300	lin.ft.	3.25	13,975
	Bituminous, asphalt concrete	41,300	sq.yd.	2.50	103,250
	Concrete pipe culvert, class V, 66"	60	lin.ft.	45.00	2,700
	Riprap (on site)	16,000	ton	3.70	59,200
	Bedding (on site)	6,600	ton	3.20	21,120
	Bedding material (from quarry)	2,000	ton	4.00	8,000
	Bridge over Meramec River	sum	job		<u>144,000</u>
	Subtotal for State highways				\$ 1,122,880
	Contingencies				<u>170,620</u>
	Total for State highways, exclusive of right-of-way				\$ 1,293,500
	Right-of-way cost for S-1				<u>23,500</u>
	Total cost for State highways				\$ 1,317,000

TABLE T-6 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	A-2, east & west road east of Meramec River				
	Clearing & grubbing	10	acre	175.00	\$ 1,750
	Stripping	15,400	cu.yd.	0.45	6,930
	Seeding & fertilizing	10	acre	200.00	2,000
	Machine grading, class I	104	station	110.00	11,440
	Base material, type I (from quarry)	8,120	ton	3.00	<u>24,360</u>
	Subtotal for Township roads				\$ 46,480
	Contingencies				<u>6,520</u>
	Subtotal for Township roads, exclusive of right-of-way				\$ 53,000
	Right-of-way costs				<u>none</u>
	Total cost for Township roads				\$ 53,000
	Subtotal for roads				\$ 1,370,000
	Operation & maintenance during construction, including contingencies				<u>62,000</u>
	Total for roads				\$ 1,432,000
.3	<u>Cemeteries, Utilities, and Structures</u>				
	<u>Cemeteries</u>				
	Cemeteries, grave relocations	sum	job		\$ 500,000
	Subtotal for cemeteries				\$ 500,000
	Contingencies				<u>75,000</u>
	Total for cemeteries				\$ 575,000
	<u>Utilities</u>				
	Power line relocations	sum	job		\$ 37,400
	Telephone line relocations	sum	job		<u>17,500</u>
	Subtotal for utilities				\$ 54,900
	Contingencies				<u>8,100</u>
	Total for utilities				\$ 63,000
	Total for cemeteries, utilities, and structures				\$ 638,000
	TOTAL FOR RELOCATIONS				\$ 2,070,000

TABLE T-6 (Cont'd)

Classification No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
03.	RESERVOIRS				(\$ 177,000)
	Bridge removal	sum	job		\$ 6,000
	Clearing, untimbered	1,700	acre	25.00	42,500
	Clearing, timbered	600	acre	175.00	105,000
	Subtotal for reservoirs				\$ 153,500
	Contingencies				23,500
	TOTAL FOR RESERVOIRS				\$ 177,000
04.	DAMS				(\$ 7,871,000)
	Cofferdam, 1st stage				
	Embankment	152,600	cu.yd.	0.55	\$ 83,930
	Embankment removal	152,600	cu.yd.	0.25	38,150
	Unwatering	sum	job		40,000
	Care of water	sum	job		35,000
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		15,000
	Subtotal for cofferdams				\$ 238,080
	Spillway				
	Excavation, common	102,000	cu.yd.	0.45	\$ 45,900
	Excavation, rock	104,000	cu.yd.	4.00	416,000
	Backfill	13,300	cu.yd.	1.25	16,625
	Riprap in exit channel	4,100	ton	3.70	15,170
	Bedding material in exit channel	2,700	ton	3.20	8,640
	Concrete, mass, overflow section	7,600	cu.yd.	35.00	266,000
	Concrete, mass, fill	14,300	cu.yd.	35.00	500,500
	Concrete, mass, abutments	80	cu.yd.	35.00	2,800
	Concrete, mass, approach walls	10	cu.yd.	35.00	350
	Concrete, mass, chute walls	820	cu.yd.	35.00	28,700
	Concrete, mass, training walls	3,040	cu.yd.	35.00	106,400
	Concrete, mass, wing walls	1,660	cu.yd.	35.00	58,100
	Concrete, reinf., abutments	240	cu.yd.	45.00	10,800
	Concrete, reinf., chute walls	1,100	cu.yd.	45.00	49,500

TABLE T-6 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Spillway (cont'd)				
	Concrete, reinf. lightly, chute floor	6,030	cu.yd.	42.00	253,260
	Concrete, reinf. lightly, stilling basin floor	4,500	cu.yd.	40.00	180,000
	Concrete, reinf. lightly, vert. rock cut facing	1,400	cu.yd.	42.00	58,800
	Drilling 1-1/2" dia. grout holes	680	lin.ft.	4.50	3,060
	Grout	680	cu.ft.	5.00	3,400
	Steel, concrete reinf.	1,770,000	lb.	0.15	265,500
	Chute floor anchor	8,710	ea.	25.00	217,750
	Vertical rock cut facing anchors	2,040	ea.	27.00	55,080
	Stilling basin floor anchor	670	ea.	39.00	26,130
	Drain holes, 2-1/2" dia.	8,870	lin.ft.	3.00	26,610
	Subtotal for spillway				\$ 2,615,075
	Outlet works				
	Excavation, common	15,000	cu.yd.	0.45	\$ 6,750
	Excavation, approach & discharge channels	28,500	cu.yd.	0.50	14,250
	Excavation, rock	1,200	cu.yd.	4.00	4,800
	Backfill	10,800	cu.yd.	1.25	13,500
	Riprap, approach & discharge channels	800	ton	3.70	2,960
	Bedding material, approach & discharge channels	350	ton	3.20	1,120
	Concrete, mass, bridge piers & abutments	1,130	cu.yd.	35.00	39,550
	Concrete, mass, approach walls	70	cu.yd.	35.00	2,450
	Concrete, ballast, in tractor gates	1	cu.yd.	35.00	35
	Concrete, reinf. bridge deck & parapets	230	cu.yd.	45.00	10,350
	Concrete, reinf. bridge abutment	7	cu.yd.	45.00	315
	Concrete, reinf. stilling basin	320	cu.yd.	45.00	14,400
	Concrete, reinf. conduit	1,880	cu.yd.	45.00	84,600
	Concrete, reinf. gate structure above base slab	2,130	cu.yd.	50.00	106,500
	Concrete, reinf., operating house	90	cu.yd.	60.00	5,400

TABLE T-6 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
Outlet works (cont'd)					
	Concrete, lightly reinf., gate structure base	150	cu.yd.	45.00	6,750
	Concrete, lightly reinf., bridge piers & abutment	290	cu.yd.	45.00	13,050
	Steel, structural, tractor gates	8,700	lb.	0.35	3,045
	Steel, structural, misc.	19,700	lb.	0.35	6,895
	Steel, structural, bulkhead	3,500	lb.	0.30	1,050
	Steel, structural, bearing piles	351,000	lb.	0.12	42,120
	Steel, structural, low- alloy bridges	260,000	lb.	0.40	104,000
	Steel, concrete reinforce- ment	655,000	lb.	0.15	98,250
	Handrail on bridge, aluminum	950	lin.ft.	2.00	1,900
	Handrail stanchions, aluminum	120	ea.	33.00	3,960
	Windows, steel, industrial, 5'x5'	6	ea.	75.00	450
	Door, steel, overhead, 10'x12'	1	ea.	335.00	335
	Tractor gate hoists	sum	job		59,000
	Electrical system	sum	job		66,000
Subtotal for outlet works					\$ 713,785

TABLE T-6 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Earth dam				
	Stripping, dam	107,000	cu.yd.	0.45	\$ 48,150
	Stripping, borrow pit	356,000	cu.yd.	0.45	160,200
	Excavation, trench	110,000	cu.yd.	0.50	55,000
	Embankment, impervious	1,460,000	cu.yd.	0.75	1,095,000
	Embankment, pervious	1,220,000	cu.yd.	0.65	793,000
	Embankment, random fill	605,000	cu.yd.	0.70	423,500
	Sand drain	143,000	ton	1.75	250,250
	Riprap	40,000	ton	3.70	148,000
	Bedding material	12,500	ton	3.20	40,000
	Gravel on downstream slope	17,500	ton	3.50	61,250
	Road surfacing, A-3, w/10" stone base	5,040	sq. yd.	3.60	18,144
	Guardrail, steel, w/wood posts	3,780	lin.ft.	3.25	12,285
	Site clearing, dam	80	acre	175.00	14,000
	Clearing, borrow pit & haul road	80	acre	175.00	14,000
	Spillway embankment	220	cu.yd.	0.60	132
	Drilling 1-1/2" dia. grout holes	17,100	lin.ft.	4.50	76,950
	Grout	17,100	cu.ft.	5.00	85,500
	Excavation rock cave entrances	30	cu.yd.	4.00	120
	Concrete, lightly reinf., cave entrances	50	cu.yd.	42.00	2,100
	Steel, concrete reinf.	2,500	lb.	0.15	375
	Piezometers	30	ea.	270.00	8,100
	Subtotal for earth dam				\$ 3,306,056
	Subtotal for main dam				\$ 6,872,996
	Contingencies				940,004
	Total for main dam				\$ 7,813,000
	Operation and maintenance during construction including contingencies				58,000
	TOTAL FOR DAMS				\$ 7,871,000

TABLE T-6 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 10,000)
	Sluice gate, 54"x54", 50' head, complete	3	ea.	2,660.00	\$ 7,980
	Portable electrical power gate operator	1	ea.	700.00	700
	Concrete, reinf., gate structure	4	cu.yd.	50.00	200
	Steel, concrete, reinf.	600	lb.	0.15	<u>90</u>
	Subtotal for fish and wildlife facilities				\$ 8,970
	Contingencies				<u>1,030</u>
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 10,000
08.	<u>ROADS, RAILROADS, AND BRIDGES</u>				(\$ 313,000)
	A-1, east & west road east of Dam 27				
	Clearing & grubbing (9" lift)	20	acre	175.00	\$ 3,500
	Stripping	27,300	cu.yd.	0.45	12,285
	Seeding & fertilizing	20	acre	200.00	4,000
	Machine grading, class I	60	station	110.00	6,600
	Machine grading, class II	130	station	150.00	19,500
	Fence, 4-strand w/wood posts	36,800	lin.ft.	1.75	64,400
	Base material, type I	9,940	ton	3.00	29,820
	Concrete pipe culvert, class V, 66"	40	lin.ft.	45.00	<u>1,800</u>
	Subtotal for A-1				\$ 141,905
	Local access roads, parking areas, grounds, and guardrail	.sum	job		\$ 100,000
	Storage, maintenance parking, & work areas:				
	Crushed stone	3,400	ton	3.50	11,900
	A-2 bituminous surfacing w/crushed stone base	4,800	sq.yd.	1.65	<u>7,920</u>
	Subtotal				\$ 261,725
	Contingencies				<u>39,775</u>
	Subtotal for roads, exclusive of right-of-way				\$ 301,500
	Right-of-way cost				<u>4,500</u>
	Subtotal roads, railroads, and bridges				\$ 306,000

TABLE T-6 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>ROADS, RAILROADS, AND BRIDGES (cont'd)</u>					
	Operation and maintenance during construction, including contingencies				\$ 7,000
	TOTAL FOR ROADS, RAILROADS, AND BRIDGES				\$ 313,000
14.	<u>RECREATION FACILITIES</u>				(\$ 460,000)
	Picnic tables (PT-2)	60	ea.	55.00	\$ 3,300
	Picnic tables (PT-1 conc.)	65	ea.	75.00	4,875
	Concrete pads	85	ea.	150.00	12,750
	Barbecue braziers	125	ea.	65.00	8,125
	Refuse containers (SR-1)	65	ea.	45.00	2,925
	Incinerators (SI-2)	12	ea.	300.00	3,600
	Comfort stations (SC-1)	1	ea.	8,000.00	8,000
	Comfort stations (SC-2 mod.)	6	ea.	6,000.00	36,000
	Shelters (PS-1)	3	ea.	2,300.00	6,900
	Central wash house & showers	2	ea.	12,000.00	24,000
	Sewage treatment system	1	ea.	8,000.00	8,000
	Sewage lines	sum	job		5,100
	Wells w/pressure tanks	3	ea.	10,000.00	30,000
	Water distribution lines	sum	job		13,900
	Fountains & hydrants	16	ea.	900.00	14,400
	Dry wells	16	ea.	500.00	8,000
	Launching ramps	sum	job		40,000
	Signs	sum	job		4,000
	Parking areas	2.25	acre	15,000.00	33,750
	Access roads	3.25	mile	15,000.00	48,750
	Paths	2	mile	8,000.00	16,000
	Sand blanket	sum	job		31,525
	Trees	110	ea.	30.00	3,300
	Seeding, mulching, & fertilizing	130	acre	160.00	20,800
	Tent campsites	sum	job		12,000
	Subtotal				\$ 400,000
	Contingencies				60,000
	TOTAL FOR RECREATION FACILITIES				\$ 460,000

TABLE T-6 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
19.	<u>BUILDINGS, GROUNDS, AND UTILITIES</u>				(\$ 217,000)
	Equipment storage building (150x30)	sum	job		\$ 15,000
	Equipment maintenance building (100x30)	sum	job		15,000
	Administration building	sum	job		75,000
	Overlook building	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	5,800
	Subtotal				\$ 148,800
	Contingencies				22,200
	Subtotal for buildings, grounds, & utilities				\$ 171,000
	Operation and maintenance during construction including contingencies				46,000
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 217,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 157,000)
	Fire fighting equipment	sum	job		\$ 28,200
	Ground maintenance equipment	sum	job		28,750
	Road maintenance equipment	sum	job		17,500
	Shop equipment	sum	job		10,950
	Miscellaneous equipment	sum	job		50,750
	Subtotal				\$ 136,150
	Contingencies				20,850
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 157,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 1,330,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 995,000
	TOTAL PROJECT COST (July 1963)				\$14,900,000

TABLE T-7
Cost estimate
Meramec River Basin, Missouri - Union Reservoir (29)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01-	Lands and damages	\$ 6,577,000
02	Relocations	4,394,000
03	Reservoirs	750,000
04	Dams	9,395,000
06	Fish and wildlife facilities	10,000
08	Roads, railroads, and bridges	341,000
14	Recreation facilities	750,000
19	Buildings, grounds, and utilities	217,000
20	Permanent operating equipment	176,000
30	Engineering and design	1,740,000
31	Supervision and administration	<u>1,250,000</u>
	Total project cost (July 1963)	\$25,600,000

TABLE T-7
Cost estimate
Meramec River Basin, Missouri - Union Reservoir (29)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.	<u>LANDS AND DAMAGES</u>				(\$6,577,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$6,252,000
.2	<u>Bureau of Outdoor Recreation</u>				
	Total lands and damages, including contingencies	sum	job		<u>325,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$6,577,000
02.	<u>RELOCATIONS</u>				(\$4,394,000)
.1	<u>Roads</u>				
	S-1, Highway 155 at Bourbeuse River				
	Clearing and grubbing	6	acre	175.00	\$ 1,050
	Stripping	21,100	cu.yd.	0.45	9,495
	Seeding and fertilizing	3	acre	200.00	600
	Embankment, compacted	713,000	cu.yd.	0.75	534,750
	Machine grading, class I	3	station	110.00	330
	Fence, removal	7,200	lin.ft.	0.50	3,600
	Base material, type I	3,540	ton	2.00	7,080
	Guardrail, steel, w/wood posts	6,400	lin.ft.	3.25	20,800
	Bituminous, roadmix (A-3)	10,100	sq.yd.	0.45	4,545
	Riprap	39,900	ton	3.70	147,630
	Bedding material	22,300	ton	3.20	71,360
	Bridge over Bourbeuse River	sum	job		191,000
	Bridge, removal	sum	job		<u>7,000</u>
	Subtotal				\$ 999,240
	S-2 Highway "CC" @ Big Creek				
	Clearing and grubbing	2	acre	175.00	\$ 350
	Stripping	7,230	cu.yd.	0.45	3,254
	Seeding and fertilizing	1	acre	200.00	200
	Embankment and compaction	22,100	cu.yd.	0.75	16,575
	Machine grading, class I	2	station	110.00	220
	Fence, removal	1,800	lin.ft.	0.50	900
	Base material, type I	840	ton	2.00	1,680
	Guardrail, steel, w/wood posts	1,400	lin.ft.	3.25	4,550

TABLE T-7 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Surface aggregate, crushed stone	280	ton	2.70	\$ 756
	Riprap	900	ton	3.70	3,330
	Bedding material	500	ton	3.20	1,600
	Bridge over Big Creek	sum	job		33,000
	Bridge removal	sum	job		<u>5,000</u>
	Subtotal				\$ 71,415
	S-3, Highway "CC" near Champion School				
	Clearing and grubbing	3	acre	175.00	\$ 525
	Stripping	3,570	cu.yd.	0.45	1,607
	Seeding and fertilizing	2	acre	200.00	400
	Embankment, compacted	38,200	cu.yd.	0.75	28,650
	Fence, removal	2,200	lin.ft.	0.50	1,100
	Fence, 4-strand w/wood posts	1,200	lin.ft.	1.75	2,100
	Base material, type I	1,120	ton	2.00	2,240
	Guardrail, steel, w/wood posts	1,200	lin.ft.	3.25	3,900
	Surface aggregate, crushed stone	380	ton	2.70	1,026
	Concrete pipe, culvert, class V, 72"	120	lin.ft.	47.00	5,640
	Riprap	2,400	ton	3.70	8,880
	Bedding material	1,300	ton	3.20	<u>4,160</u>
	Subtotal				\$ 60,228
	S-4, Route "AC"				
	Clearing and grubbing	13	acre	175.00	\$ 2,275
	Stripping	17,300	cu.yd.	0.45	7,785
	Excavation, class A	38,300	cu.yd.	1.00	38,300
	Excavation, rock	5,500	cu.yd.	7.50	41,250
	Seeding and fertilizing	12	acre	200.00	2,400
	Embankment, compacted	1,600	cu.yd.	0.75	1,200
	Machine grading, class I	40	station	110.00	4,400
	Machine grading, class II	50	station	150.00	7,500
	Fence, removal	19,000	lin.ft.	0.50	9,500
	Fence, 4-strand w/wood posts	19,000	lin.ft.	1.75	33,250
	Base material, type I	7,420	ton	2.00	14,840
	Surface aggregate, crushed stone	2,520	ton	2.70	6,804
	Bridge over Boone Creek	sum	job		<u>29,000</u>
	Subtotal				\$ 198,504

TABLE T-7 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Subtotal for state highways				\$1,529,387
	Contingencies				<u>199,813</u>
	Subtotal for state highways, exclusive of right-of-way				\$1,529,200
	Right-of-way costs:				
	State highway S-1				\$ 5,800
	State highway S-4				<u>5,000</u>
	Subtotal for right-of-way costs				\$ 10,800
	Total costs for state highways				\$1,540,000
	C-1, East and West road south of Voss Creek				
	Clearing and grubbing	30	acre	175.00	\$ 5,250
	Stripping	41,000	cu.yd.	0.45	18,450
	Seeding and fertilizing	20	acre	200.00	4,000
	Machine grading, class II	160	station	150.00	24,000
	Fence, 4-strand w/wood posts	31,600	lin.ft.	1.75	55,300
	Base material, type II	12,300	ton	2.50	30,750
	Surface aggregate, crushed stone	4,060	ton	2.70	<u>10,962</u>
	Subtotal				\$ 148,712
	C-2, North and South road east of Roaring Spring				
	Clearing and grubbing	9	acre	175.00	\$ 1,575
	Stripping	11,500	cu.yd.	0.45	5,175
	Excavation, class A	18,600	cu.yd.	1.00	18,600
	Seeding and fertilizing	8	acre	200.00	1,600
	Machine grading, class I	60	station	110.00	6,600
	Fence, removal	5,600	lin.ft.	0.50	2,800
	Fence, 4-strand w/wood posts	13,000	lin.ft.	1.75	22,750
	Base material, type II	5,040	ton	2.50	12,600
	Surface aggregate, crushed stone	1,680	ton	2.70	<u>4,536</u>
	Subtotal				\$ 76,236

TABLE T-7 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	C-3, Highway "JJ" @ Spring Creek				
	Clearing and grubbing	20	acre	175.00	\$ 3,500
	Stripping	25,200	cu.yd.	0.45	11,340
	Excavation, class A	111,000	cu.yd.	1.00	111,000
	Excavation, rock	41,300	cu.yd.	7.50	309,750
	Seeding and fertilizing	20	acre	200.00	4,000
	Embankment, compacted	501,000	cu.yd.	0.75	375,750
	Machine grading, class I	60	station	110.00	6,600
	Fence, removal	11,200	lin.ft.	0.50	5,600
	Fence, 4-strand w/wood posts	14,800	lin.ft.	1.75	25,900
	Base material, type I	7,140	ton	2.00	14,280
	Guardrail, steel, w/wood posts	2,600	lin.ft.	3.25	8,450
	Bituminous, road mix (A-3)	20,400	sq.yd.	0.45	9,180
	Riprap	27,900	ton	3.70	103,230
	Bedding material	17,200	ton	3.20	55,040
	Bridge over Spring Creek	sum	job		<u>119,000</u>
	Subtotal				\$1,162,620
	Subtotal for county roads				\$1,387,568
	Contingencies				<u>208,432</u>
	Subtotal for county roads, exclusive of right-of-way				\$1,596,000
	Right-of-way costs:				
	County road C-1				\$ 9,500
	County road C-2				4,500
	County road C-3				<u>7,000</u>
	Subtotal for right-of-way costs				\$ 21,000
	Total cost for county roads				\$1,617,000

TABLE T-7 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
	A-2, East and West road near Duly School				
	Clearing and grubbing	8	acre	175.00	\$ 1,400
	Stripping	11,900	cu.yd.	0.45	5,355
	Seeding and fertilizing	6	acre	200.00	1,200
	Machine grading, class I	50	station	110.00	5,500
	Fence, 4-strand w/wood posts	9,200	lin.ft.	1.75	16,100
	Base material, type I	3,640	ton	2.00	<u>7,280</u>
	Subtotal				\$ 36,835
	A-3, North and South road south of Bourbeuse River				
	Clearing and grubbing	20	acre	175.00	\$ 3,500
	Stripping	19,300	cu.yd.	0.45	8,685
	Seeding and fertilizing	10	acre	200.00	2,000
	Embankment, compacted	7,500	cu.yd.	0.75	5,625
	Machine grading, class I	130	station	110.00	14,300
	Fence, removal	26,000	lin.ft.	0.50	13,000
	Fence, 4-strand w/wood posts	26,000	lin.ft.	1.75	45,500
	Base material, type I	10,100	ton	2.00	20,200
	Guardrail, steel w/wood posts	500	lin.ft.	3.25	1,625
	Riprap	250	ton	3.70	925
	Bedding material	150	ton	3.20	<u>480</u>
	Subtotal				\$ 115,840
	A-4, East and West road north of Peters Ford				
	Clearing and grubbing	6	acre	175.00	\$ 1,050
	Stripping	8,230	cy.yd.	0.45	3,704
	Seeding and fertilizing	6	acre	200.00	1,200
	Machine grading, class I	40	station	110.00	4,400
	Fence, 4-strand w/wood posts	7,600	lin.ft.	1.75	13,300
	Base material, type I	2,800	ton	2.00	<u>5,600</u>
	Subtotal				\$ 29,254
	Subtotal for township roads				\$ 181,929
	Contingencies				<u>27,071</u>
	Subtotal for township roads, exclusive of right-of-way				\$ 209,000

TABLE T-7 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Right of way costs:				
	Township road A-2				\$ 15,000
	Township road A-3				9,000
	Township road A-4				<u>11,000</u>
	Subtotal for right-of-way costs				\$ 35,000
	Total cost for township roads				\$ 244,000
	Subtotal for roads				\$ 3,401,000
	Operation and maintenance during construction, including contingencies				<u>87,000</u>
	Total for roads				\$ 3,488,000
.3	<u>Cemeteries, Utilities, and Structures</u>				
	<u>Cemeteries</u>				
	Cemeteries, grave relocations	sum	job		\$ <u>500,000</u>
	Subtotal for cemeteries				\$ 500,000
	Contingencies				<u>75,000</u>
	Total for cemeteries				\$ 575,000
	<u>Utilities</u>				
	Power line relocations	sum	job		\$ 200,000
	Telephone line relocations	sum	job		<u>87,500</u>
	Subtotal for utilities				\$ 287,500
	Contingencies				<u>43,500</u>
	Total for utilities				\$ 331,000
	Total for cemeteries, utilities and structures				\$ 906,000
	TOTAL FOR RELOCATIONS				\$ 4,394,000

TABLE T-7 (Cont'd)

Classification No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
03.	<u>RESERVOIRS</u>				(\$ 750,000)
	Clearing, untimbered	3,000	acre	25.00	75,000
	Clearing, timbered	3,300	acre	175.00	577,000
	Subtotal for reservoirs				\$ 652,500
	Contingencies				97,500
	TOTAL FOR RESERVOIRS				\$ 750,000
04.	<u>DAMS</u>				(\$9,395,000)
	Cofferdam, 1st stage				
	Embankment	123,000	cu.yd.	0.55	\$ 67,650
	Embankment removal	123,000	cu.yd.	0.25	30,750
	Unwatering	sum	job		35,000
	Care of water	sum	job		30,000
	Cofferdam, 2nd stage				
	Embankment	11,100	cu.yd.	0.55	6,105
	Embankment removal	11,100	cu.yd.	0.25	2,775
	Unwatering	sum	job		20,000
	Care of water	sum	job		15,000
	Subtotal for cofferdams				\$ 207,280
	Spillway				
	Excavation, common	165,000	cu.yd.	0.45	\$ 74,250
	Excavation, rock	238,000	cu.yd.	4.00	952,000
	Backfill	10,600	cu.yd.	1.25	13,250
	Riprap in exit channel	4,100	ton	3.70	15,170
	Bedding material in exit channel	2,700	ton	3.20	8,640
	Concrete, mass over- flow section	7,300	cu.yd.	35.00	255,500
	Concrete, mass, fill	25,600	cu.yd.	35.00	896,000
	Concrete, mass, abutments	470	cu.yd.	35.00	16,450
	Concrete, mass, approach walls	70	cu.yd.	35.00	2,450
	Concrete, mass, chute walls	890	cu.yd.	35.00	31,150
	Concrete, reinf., abutments	240	cu.yd.	45.00	10,800
	Concrete, reinf., approach walls	3,600	cu.yd.	45.00	162,000
	Concrete, reinf., chute walls	1,930	cu.yd.	45.00	86,850
	Concrete, reinf., training walls	1,830	cu.yd.	45.00	82,350
	Concrete, reinf., wing walls	770	cu.yd.	45.00	34,650

TABLE T-7 (Cont'd)

Classifi-
cation
No.

<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
Concrete, lightly reinf., chute floor	5,600	cu.yd.	42.00	\$ 235,200
Concrete, lightly reinf., stilling basin floor	4,200	cu.yd.	40.00	168,000
Concrete, lightly reinf., vert. rock cut facing	1,040	cu.yd.	42.00	43,680
Steel, concrete reinf.	2,340,000	lb.	0.15	351,000
Drilling 1-1/2" dia. grout holes	700	lin.ft.	4.50	3,150
Grout	700	cu.ft.	5.00	3,500
Chute floor anchor	8,150	ea.	25.00	203,750
Vertical rock cut facing anchors	1,550	ea.	27.00	41,850
Stilling basin floor anchor	610	ea.	39.00	23,790
Drain holes, 2-1/2 " dia.	8,360	lin.ft.	3.00	25,080
Spillway bridge	sum	job		<u>66,000</u>
Subtotal for spillway				\$3,806,510
Outlet works				
Excavation, common	44,500	cu.yd.	0.45	\$ 20,025
Excavation, approach and discharge channels	57,700	cu.yd.	0.50	28,850
Excavation, rock	3,640	cu.yd.	4.00	14,560
Backfill	27,700	cu.yd.	1.25	34,625
Riprap, approach and discharge channels	2,150	ton	3.70	7,955
Bedding material, approach and discharge channels	950	ton	3.20	3,040
Concrete, mass, bridge piers and abutment	1,140	cu.yd.	35.00	39,900
Concrete, mass, approach walls	330	cu.yd.	35.00	11,550
Concrete, ballast, in tractor gates	6	cu.yd.	35.00	210
Concrete, reinf., bridge deck and parapets	190	cu.yd.	45.00	8,550

TABLE T-7 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Concrete, reinf., bridge abutment	7	cu.yd.	45.00	\$ 315
	Concrete, reinf. stilling basin	1,120	cu.yd.	45.00	50,400
	Concrete, reinf. conduit	5,080	cu.yd.	45.00	228,600
	Concrete, reinf., gate struct. above base slab	3,510	cu.yd.	50.00	175,500
	Concrete, reinf., operating house	150	cu.yd.	60.00	9,000
	Concrete, lightly reinf., gate structure base	390	cu.yd.	45.00	17,550
	Concrete, lightly reinf., bridge piers and abutment	290	cu.yd.	45.00	13,050
	Steel, structural, trac. gates	45,000	lb.	0.35	15,750
	Steel, structural, misc.	20,500	lb.	0.35	7,175
	Steel, structural, bulkhead	3,600	lb.	0.30	1,080
	Steel, structural, bearing piles	402,000	lb.	0.12	48,240
	Steel, structural, low-alloy bridges	186,000	lb.	0.40	74,400
	Steel, concrete, reinf.	1,420,000	lb.	0.15	213,000
	Handrail on bridge, aluminum	800	lin.ft.	2.00	1,600
	Handrail stanchions, aluminum	100	ea.	33.00	3,300
	Windows, steel, industrial, 5' x 5'	6	ea.	75.00	450
	Door, steel, overhead 10' x 12'	1	ea.	335.00	335
	Tractor gate hoists	sum	job		98,000
	Electrical system	sum	job		94,200
	Subtotal for outlet works				\$1,221,210

TABLE T-7 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Earth dam				
	Stripping, dam	96,100	cu.yd.	0.45	\$ 43,245
	Stripping, borrow pit	125,000	cu.yd.	0.45	56,250
	Excavation, trench	65,600	cu.yd.	0.50	32,800
	Embankment, impervious	1,680,000	cu.yd.	0.75	1,260,000
	Embankment, pervious	810,000	cu.yd.	0.65	526,500
	Sand drain	81,800	ton	1.75	143,150
	Gravel toe drain	25,000	ton	2.50	62,500
	Riprap	27,900	ton	3.70	103,230
	Bedding material	11,600	ton	3.20	37,120
	Gravel on down- stream slope - 6"	15,900	ton	2.70	42,930
	Road surfacing, A-3, w/10" stone base	9,390	sq.yd.	3.00	28,170
	Guardrail, steel w/wood posts	7,040	lin.ft.	3.25	22,880
	Site clearing, dam	80	acre	175.00	14,000
	Clearing, borrow pit and haul road	40	acre	175.00	7,000
	Drilling 1-1/2" Ø grout holes	44,300	lin.ft.	4.50	199,350
	Grout	44,300	cu.ft.	5.00	221,500
	Spillway embankment	55,600	cu.yd.	0.60	33,360
	Riprap, spillway embankment	960	ton	3.70	3,552
	Bedding material, embankment	630	ton	3.20	2,016
	Piezometers	57	ea.	270.00	15,390
	Subtotal for earth dam				\$2,854,943
	Subtotal for main dam				\$8,089,943
	Contingencies				<u>1,213,057</u>
	Total for main dam				\$9,303,000

TABLE T-7 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Operation and maintenance during construction, including contingencies				\$ 92,000
	TOTAL FOR DAMS				\$9,395,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 10,000)
	Sluice gate, 54"x54", 50' head, complete	3	ea.	2,660.00	\$ 7,980
	Portable electrical power gate operator	1	ea.	700.00	700
	Concrete, reinf., gate structure	4	cu.yd.	50.00	200
	Steel, concrete reinf.	600	lb.	0.15	90
	Subtotal for fish and wildlife facilities				\$ 8,970
	Contingencies				1,030
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 10,000
08.	<u>ROADS, RAILROADS, AND BRIDGES</u>				(\$ 341,000)
	A-1, North and South road over dam				
	Clearing and grubbing	20	acre	175.00	\$ 3,500
	Stripping	25,000	cu.yd.	0.45	11,250
	Excavation, class A	6,600	cu.yd.	1.00	6,600
	Excavation, rock	3,300	cu.yd.	7.50	24,750
	Seeding and fertilizing	20	acre	200.00	4,000
	Machine grading, class II	150	station	150.00	22,500
	Fence, removal	24,200	lin.ft.	0.50	12,100
	Fence, 4-strand w/wood posts	31,600	lin.ft.	1.75	55,300
	Base material, type I	12,200	ton	2.00	24,400
	Subtotal for A-1				\$ 164,400
	Local access roads, park- ing areas, grounds, and guardrails	sum	job		\$ 100,000
	Storage and maintnenace, parking and work areas:				
	Crushed stone	3,400	ton	2.70	9,180
	A-2 bituminous surfacing w/crushed stone base	4,800	sq.yd.	1.65	7,920
	Subtotal				\$ 281,500
	Contingencies				42,800
	Subtotal for roads, exclusive of right- of-way				\$ 324,300

TABLE T-7 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Right-of-way cost				\$ 11,700
	Subtotal for roads, railroads, and bridges				\$ 336,000
	Operation and maintenance during construction, including contingencies				5,000
	TOTAL FOR ROADS, RAILROADS, AND BRIDGES				\$ 341,000
14.	<u>RECREATION FACILITIES</u>				(\$ 750,000)
	Picnic tables (PT-2)	95	ea.	55.00	\$ 5,225
	Picnic tables (PT-1 conc.)	105	ea.	75.00	7,875
	Concrete pads	170	ea.	150.00	25,500
	Barbecue braziers	200	ea.	65.00	13,000
	Refuse containers (SR-1)	105	ea.	45.00	4,725
	Incinerators (SI-2)	20	ea.	300.00	6,000
	Comfort stations (SC-1)	1	ea.	8,000.00	8,000
	Comfort stations (SC-2) mod.	11	ea.	6,000.00	66,000
	Shelters (PS-1)	4	ea.	2,300.00	9,200
	Central wash house and showers	3	ea.	12,000.00	36,000
	Sewage treatment system	1	ea.	8,000.00	8,000
	Sewage lines	sum	job		8,300
	Wells w/pressure tanks	5	ea.	10,000.00	50,000
	Water distribution lines	sum	job		22,600
	Fountains and hydrants	26	ea.	900.00	23,400
	Dry wells	26	ea.	500.00	13,000
	Launching ramps	sum	job		60,000
	Signs	sum	job		6,000
	Parking areas	3.5	acre	15,000.00	52,500
	Access roads	5.5	mile	15,000.00	82,500
	Paths	4	mile	8,000.00	32,000
	Sand blanket	sum	job		58,575
	Trees	200	ea.	30.00	6,000
	Seeding, mulching and fertilizing	180	acre	160.00	28,800
	Tent campsites	sum	job		19,000
	Subtotal				\$ 652,200
	Contingencies				97,800
	TOTAL FOR RECREATION FACILITIES				\$ 750,000

TABLE T-7 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
19.	<u>BUILDINGS, GROUNDS, AND UTILITIES</u>				(\$ 217,000)
	Equipment storage bldg. (150' x 30')	sum	job		\$ 15,000
	Equipment maintenance bldg. (100' x 30')	sum	job		15,000
	Administration bldg.	sum	job		75,000
	Overlook bldg.	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	<u>5,800</u>
	Subtotal				\$ 148,800
	Contingencies				<u>22,200</u>
	Subtotal buildings, grounds, and utilities				\$ 171,000
	Operation and maintenance during construction, including contingencies				<u>46,000</u>
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 217,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 176,000)
	Fire fighting equipment	sum	job		\$ 28,200
	Ground maintenance equipment	sum	job		36,750
	Road maintenance equipment	sum	job		17,500
	Shop equipment	sum	job		15,400
	Miscellaneous equipment	sum	job		<u>55,500</u>
	Subtotal				\$ 153,350
	Contingencies				<u>22,650</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 176,000
30.	<u>ENGINEERING AND DESIGN</u>				\$1,740,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$1,250,000
	TOTAL PROJECT COST (July 1963)				\$25,600,000

TABLE T-8
Cost estimate
Meramec River Basin, Missouri - Virginia Mines Reservoir (40)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01 -	Lands and damages	\$ 3,915,000
02	Relocations	3,219,000
03	Reservoirs	492,000
04	Dams	6,590,000
06	Fish and wildlife facilities	10,000
08	Roads, railroads, and bridges	407,000
14	Recreation facilities	1,000,000
19	Buildings, grounds, and utilities	217,000
20	Permanent operating equipment	149,000
30	Engineering and design	1,410,000
31	Supervision and administration	<u>991,000</u>

Total project cost (July 1963) \$18,400,000

TABLE T-8
Cost estimate
Meramec River Basin, Missouri - Virginia Mines Reservoir (40)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.	<u>LANDS AND DAMAGES</u>				(\$3,915,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$3,283,000
.2	<u>Bureau of Outdoor Recreation</u>				
	Total lands and damages, including contingencies	sum	job		<u>632,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$3,915,000
02.	<u>RELOCATIONS</u>				(\$3,219,000)
.1	<u>Roads</u>				
	S-1, Highway "K" at Meramec River				
	Clearing and grubbing	40	acre	175.00	\$ 7,000
	Stripping	147,000	sq.yd.	0.45	66,150
	Excavation, class A	123,000	cu.yd.	1.00	123,000
	Excavation, rock	14,300	cu.yd.	7.50	107,250
	Seeding and fertilizing	20	acre	200.00	4,000
	Machine grading, class I	20	station	110.00	2,200
	Machine grading, class II	110	station	150.00	16,500
	Embankment, compacted	506,000	cu.yd.	0.75	379,500
	Fence removal	28,200	lin.ft.	0.50	14,100
	Fence, 4-strand w/ wood post	28,200	lin.ft.	1.75	49,350
	Guardrail, steel, w/ wood post	6,600	lin.ft.	3.25	21,450
	Bituminous road mix (A-3)	66,000	sq.yd.	0.45	29,700
	Riprap	26,200	ton	3.70	96,940
	Bedding material	14,100	ton	3.20	45,120
	Bridge over Meramec River	sum	job		<u>204,000</u>
	Subtotal				\$1,166,260
	Subtotal for state highways				\$1,166,260
	Contingencies				<u>174,740</u>
	Subtotal for state highways, exclusive of right-of-way				\$1,341,000

TABLE T-8 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
RELOCATIONS (Cont'd)					
	Right-of-way cost state highway S-1				\$ 110,000
	Subtotal for right-of-way costs				\$ 110,000
	Total cost for state highways				\$1,451,000
C-1, East and West Road at Indian Creek					
	Clearing and grubbing	10	acre	175.00	\$ 1,750
	Stripping	87,300	sq.yd.	0.45	39,285
	Excavation, class A	20,700	cu.yd.	1.00	20,700
	Excavation, rock	14,500	cu.yd.	7.50	108,750
	Seeding and fertilizing	8	acre	200.00	1,600
	Embankment, compacted	177,000	cu.yd.	0.75	132,750
	Machine grading, class I	6	station	110.00	660
	Machine grading, class II	30	station	150.00	4,500
	Fence removal	6,200	lin.ft.	0.50	3,100
	Fence 4-strand w/ wood posts	6,200	lin.ft.	1.75	10,850
	Base material, type I	6,300	ton	2.00	12,600
	Guardrail, steel, w/ wood post	3,900	lin.ft.	3.25	12,675
	Surface aggregate, crushed stone	1,900	ton	2.70	5,130
	Riprap	11,000	ton	3.70	40,700
	Bedding material	5,900	ton	3.20	18,880
	Bridge over Indian Creek	sum	job		158,000
	Subtotal				\$ 571,930

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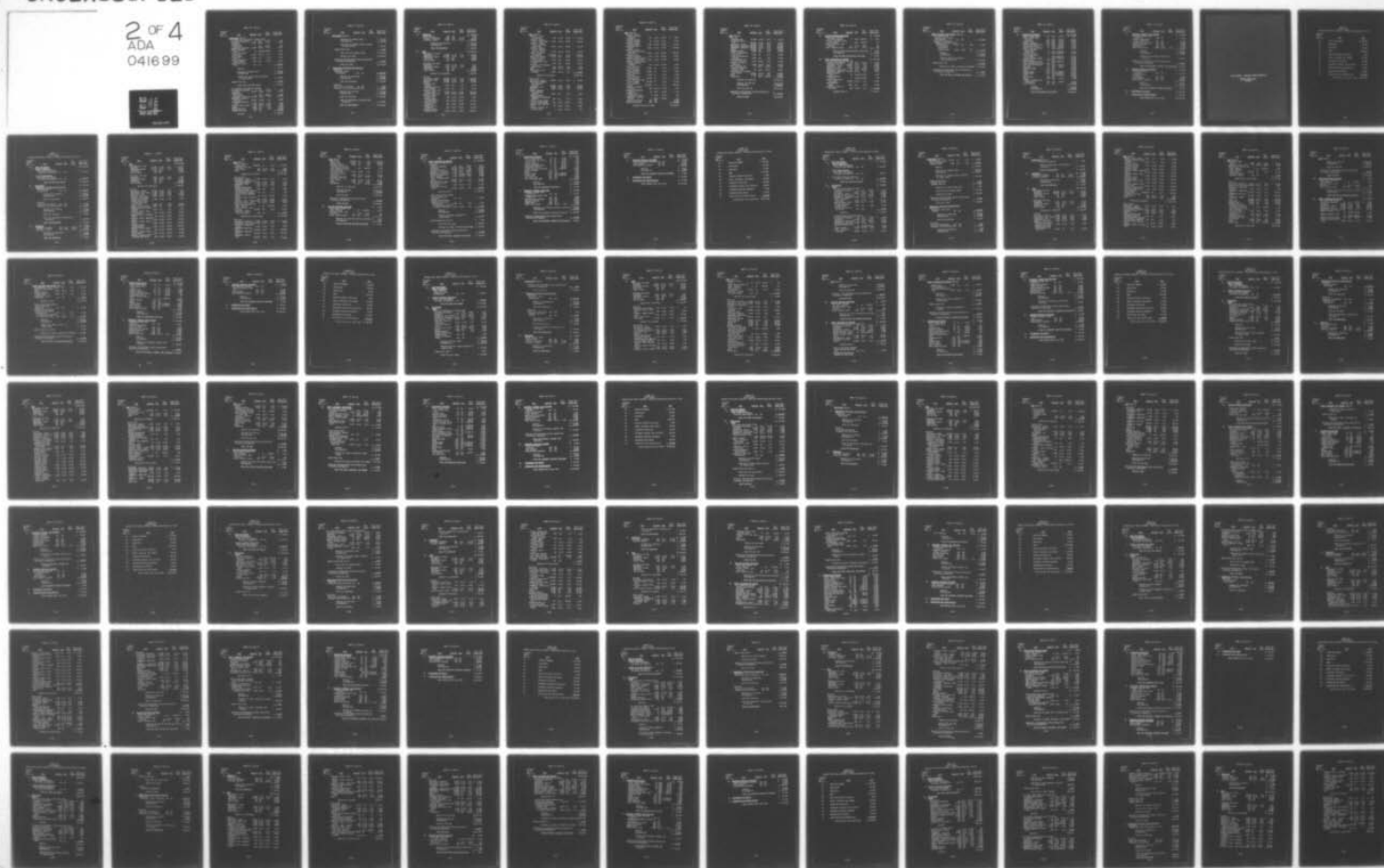
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MERAMEC RIVER, MISSOURI COMPREHENSIVE BASIN STUDY. VOLUME VIII.--ETC(U)
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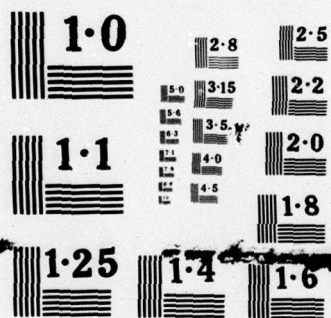
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NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART

TABLE T-8 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
RELOCATIONS (Cont'd)					
	C-2, North and South Road at Indian Creek				
	Clearing and grubbing	2	acre	175.00	\$ 350
	Stripping	17,800	sq.yd.	0.45	8,010
	Seeding and fertilizing	1	acre	200.00	200
	Embankment, compacted	5,800	cu.yd.	0.75	4,350
	Machine grading, class I	11	station	110.00	1,210
	Fence, 4-strand w/ wood post	3,500	lin.ft.	1.75	6,125
	Base material, type II	2,900	ton	2.50	7,250
	Surface aggregate, crushed stone	880	ton	2.70	2,376
	Bridge over Indian Creek	sum	job		<u>22,900</u>
	Subtotal				\$ 52,771
	Subtotal for county roads				\$ 624,701
	Contingencies				<u>93,299</u>
	Subtotal for county roads, exclusive of right-of-way				\$ 718,000
	Right-of-way cost				<u>None</u>
	Total cost for county roads				\$ 718,000
	A-2, Highway "W" by Meramec Caverns				
	Clearing and grubbing	3	acre	175.00	\$ 525
	Stripping	35,600	sq.yd.	0.45	16,020
	Seeding and fertilizing	5	acre	200.00	1,000
	Embankment, compacted	172,000	cu.yd.	0.75	129,000
	Guardrail, steel w/ wood post	10,400	lin.ft.	3.25	33,800
	Bituminous road mix, (A-3)	15,400	sq.yd.	0.45	6,930
	Concrete pipe culvert	150	lin.ft.	47.00	7,050
	Riprap	6,200	ton	3.70	22,940
	Bedding material	3,300	ton	3.20	10,560
	Bridge over creek	sum	job		<u>34,000</u>
	Subtotal				\$ 261,825

TABLE T-8 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>RELOCATIONS (Cont'd)</u>					
	Subtotal for township roads				\$ 261,825
	Contingencies				<u>39,175</u>
	Subtotal for township roads, exclusive of right-of-way				\$ 301,000
	Right-of-way costs				<u>None</u>
	Total cost for township roads				\$ 301,000
	Subtotal for roads				\$2,470,000
	Operation and maintenance during construction, including contingencies				<u>41,000</u>
	Total for roads				\$2,511,000
.3	<u>Cemeteries, Utilities and Structures</u>				
	Cemeteries				
	Cemeteries, grave relocations	sum	job		<u>\$ 500,000</u>
	Subtotal for cemeteries				\$ 500,000
	Contingencies				<u>75,000</u>
	Total for cemeteries				\$ 575,000
	Utilities				
	Power line relocations	sum	job		\$ 77,600
	Telephone line relocations	sum	job		<u>37,500</u>
	Subtotal for utilities				\$ 115,100
	Contingencies				<u>17,900</u>
	Total for utilities				\$ 133,000
	Total for cemeteries, utilities, and structures				\$ 708,000
	TOTAL FOR RELOCATIONS				\$3,219,000

TABLE T-8 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
03.	<u>RESERVOIRS</u>				(\$ 492,000)
	Bridge removal	sum	job		\$ 5,000
	Clearing, untimbered	2,900	acre	25.00	72,500
	Clearing, timbered	2,000	acre	175.00	350,000
	Subtotal for reservoirs				\$ 427,500
	Contingencies				64,500
	TOTAL FOR RESERVOIRS				\$ 492,000
04.	<u>DAMS</u>				(\$6,590,000)
	Cofferdam, 1st stage				
	Embankment	160,000	cu.yd.	0.55	\$ 88,000
	Embankment removal	160,000	cu.yd.	0.25	40,000
	Unwatering	sum	job		35,000
	Care of water	sum	job		30,000
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		15,000
	Subtotal for cofferdams				\$ 234,000
	Spillway				
	Excavation, common	370,000	cu.yd.	0.45	\$ 166,500
	Excavation, rock	200,000	cu.yd.	4.00	800,000
	Backfill	22,000	cu.yd.	1.25	27,500
	Riprap in exit channel	4,100	ton	3.70	15,170
	Bedding material in exit channel	2,700	ton	3.20	8,640
	Concrete, mass, over- flow section	8,350	cu.yd.	35.00	292,250
	Concrete, mass fill	8,100	cu.yd.	35.00	283,500
	Concrete, mass, chute walls	180	cu.yd.	35.00	6,300
	Concrete, mass, training walls	330	cu.yd.	35.00	11,550
	Concrete, mass, wing walls	290	cu.yd.	35.00	10,150
	Concrete, reinf., abutments	580	cu.yd.	45.00	26,100
	Concrete, reinf., approach walls	4,300	cu.yd.	45.00	193,500

TABLE T-8 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
DAMS (Cont'd)					
	Concrete, reinf., chute walls	820	cu.yd.	45.00	\$ 36,900
	Concrete, lightly reinf., chute floor	4,670	cu.yd.	42.00	196,140
	Concrete, lightly reinf., stilling basin floor	4,360	cu.yd.	40.00	174,400
	Concrete, lightly reinf., vertical rock cut facing	1,810	cu.yd.	42.00	76,020
	Steel, concrete reinforcing	1,830,000	lb.	0.15	274,500
	Chute floor anchor	6,700	each	25.00	167,500
	Vertical rock cut facing anchor	2,650	each	27.00	71,550
	Stilling basin floor anchor	630	each	39.00	24,570
	Drilling 1-1/2" diameter grout holes	750	lin.ft.	4.50	3,375
	Grout	1,500	cu.ft.	5.00	7,500
	Drain holes 2-1/2" diameter	7,060	lin.ft.	3.00	<u>21,180</u>
	Subtotal for spillway				\$2,894,795
Outlet works					
	Excavation, common	22,800	cu.yd.	0.45	\$ 10,260
	Excavation, approach and discharge channels	28,500	cu.yd.	0.50	14,250
	Excavation, rock	5,000	cu.yd.	4.00	20,000
	Backfill	9,000	cu.yd.	1.25	11,250
	Riprap, approach and discharge channels	1,600	ton	3.70	5,920
	Bedding material, approach and discharge channels	700	ton	3.20	2,240
	Concrete, mass, bridge piers and abutments	200	cu.yd.	35.00	7,000
	Concrete, mass approach walls	80	cu.yd.	35.00	2,800
	Concrete, ballast, in tractor gates	9	cu.yd.	35.00	315

TABLE T-8 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>DAMS (Cont'd)</u>					
	Concrete, reinf., bridge deck and parapets	130	cu.yd.	45.00	\$ 5,850
	Concrete, reinf., bridge abutment	30	cu.yd.	45.00	1,350
	Concrete, reinf., stilling basin	1,380	cu.yd.	45.00	62,100
	Concrete, reinf., conduit	3,520	cu.yd.	45.00	158,400
	Concrete, reinf., gate structure above base slab	4,560	cu.yd.	50.00	228,000
	Concrete, reinf., operating house	250	cu.yd.	60.00	15,000
	Concrete, lightly reinf., gate structure base	1,240	cu.yd.	45.00	55,800
	Concrete, lightly reinf., bridge piers and abutment	110	cu.yd.	45.00	4,950
	Steel, structure, tractor gates	61,500	lb.	0.35	21,525
	Steel, structure, miscellaneous	15,000	lb.	0.35	5,250
	Steel, structure, bulkhead	15,600	lb.	0.30	4,680
	Steel, structure, bearing piles	64,500	lb.	0.12	7,740
	Steel, structure, low- alloy bridges	89,300	lb.	0.40	35,720
	Steel, concrete reinf.	1,270,000	lb.	0.15	190,500
	Handrail on bridge, aluminum	520	lin.ft.	2.00	1,040
	Handrail stanchions, aluminum	66	each	33.00	2,178
	Windows, steel, industrial, 5'x5'	6	each	75.00	450
	Door, steel, overhead, 10'x12'	1	each	335.00	335
	Tractor gate hoists	sum	job		73,000
	Electrical system	sum	job		63,000
Subtotal for outlet works					\$1,010,903

TABLE T-8 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
DAMS (Cont'd)					
	Earth dam				
	Stripping, dam	62,000	cu.yd.	0.45	\$ 27,900
	Stripping, borrow pit	296,000	cu.yd.	0.45	133,200
	Excavation, trench	29,600	cu.yd.	0.50	14,800
	Embankment, impervious	700,000	cu.yd.	0.75	525,000
	Embankment, pervious	600,000	cu.yd.	0.65	390,000
	Riprap	18,000	ton	3.70	66,600
	Bedding material	8,500	ton	3.20	27,200
	Gravel on downstream (on site)	4,000	ton	2.70	10,800
	Gravel on downstream (quarry)	4,500	ton	5.00	22,500
	Road surfacing, A-3, w/10" stone base	6,500	sq.yd.	3.00	19,500
	Guardrail, steel, w/ wood post	4,880	lin.ft.	3.25	15,860
	Site clearing, dam	54	acre	175.00	9,450
	Clearing, borrow pit and haul road	60	acre	175.00	10,500
	Drilling 1-1/2" diameter grout holes	17,000	lin.ft.	4.50	76,500
	Grout	33,000	cu.ft.	5.00	165,000
	Piezometers	39	each	270.00	10,530
	Subtotal for earth dam				\$1,525,340
	Subtotal for main dam				\$5,665,038
	Contingencies				<u>849,962</u>
	Total for main dam				\$6,515,000
	Operation and maintenance during construction, including contingencies				<u>\$ 75,000</u>
	TOTAL FOR DAMS				\$6,590,000

TABLE T-8 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 10,000)
	Sluice gate, 54"x54", 50' head, complete	3	each	2,660.00	\$ 7,980
	Portable electrical power gate operator	1	each	700.00	700
	Concrete, reinf., gate structure	4	cu.yd.	50.00	200
	Steel, concrete reinf.	600	lb.	0.15	90
	Subtotal for fish and wildlife facilities				\$ 8,970
	Contingencies				1,030
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 10,000
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 407,000)
	A-1, East and West Road over Dam				
	Clearing and grubbing	30	acre	175.00	\$ 5,250
	Stripping, 12" lift	170,000	cu.yd.	0.45	76,500
	Excavation, class A	16,500	cu.yd.	1.00	16,500
	Excavation, rock	1,500	cu.yd.	7.50	11,250
	Seeding and fertilizing	20	acre	200.00	4,000
	Embankment, compacted	22,500	cu.yd.	0.75	16,875
	Machine grading, class I	90	station	110.00	9,900
	Machine grading, class II	6	station	150.00	900
	Fence, 4-strand, w/ wood posts	18,400	lin.ft.	1.75	32,200
	Base material, type I	7,840	ton	2.00	15,680
	Guardrail, steel, w/ wood post	800	lin.ft.	3.25	2,600
	Subtotal for A-1				\$ 191,655

TABLE T-8 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>ROADS, RAILROADS AND BRIDGES (Cont'd)</u>					
	Local access roads, parking areas, grounds and guardrail	sum	job		\$ 100,000
	Storage and maintenance, parking and working areas:				
	Crushed stone	3,400	ton	5.00	17,000
	A-2 bituminous surfacing w/ crushed stone	4,800	sq.yd.	1.65	<u>7,920</u>
	Subtotal				\$ 316,575
	Contingencies				<u>47,025</u>
	Total for roads, exclusive of right-of-way cost				\$ 363,600
	Right-of-way cost				<u>38,400</u>
	Subtotal for roads, railroads and bridges				\$ 402,000
	Operation and maintenance during construction, including contingencies				<u>5,000</u>
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$ 407,000

TABLE T-8 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
14.	RECREATION FACILITIES				(\$1,000,000)
	Picnic tables (PT-2)	125	each	55.00	\$ 6,875
	Picnic tables (PT-1 concrete)	140	each	75.00	10,500
	Concrete pads	220	each	150.00	33,000
	Barbecue braziers	270	each	65.00	17,550
	Refuse containers (SR-1)	145	each	45.00	6,525
	Incinerators (SI-2)	27	each	300.00	8,100
	Comfort stations (SC-1)	2	each	8,000.00	16,000
	Comfort stations (SC-2) mod.	13	each	6,000.00	78,000
	Shelters (PS-1)	5	each	2,300.00	11,500
	Central wash house and showers	4	each	12,000.00	48,000
	Sewage treatment system	2	each	8,000.00	16,000
	Sewage lines	sum	job		11,100
	Wells w/pressure tanks	7	each	10,000.00	70,000
	Water distribution lines	sum	job		30,200
	Fountains and hydrants	35	each	900.00	31,500
	Dry wells	23	each	500.00	11,500
	Launching ramps	sum	job		80,000
	Signs	sum	job		10,000
	Parking areas	4.75	acre	15,000.00	71,250
	Access roads	7.50	mile	15,000.00	112,500
	Paths	4	mile	8,000.00	32,000
	Sand blanket	sum	job		64,600
	Trees	250	each	30.00	7,500
	Seeding, mulching, and fertilizing	380	acre	160.00	60,800
	Tent campsites	sum	job		25,000
	Subtotal				\$ 870,000
	Contingencies				130,000
	TOTAL FOR RECREATION FACILITIES				\$1,000,000

TABLE T-8 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
19.	<u>BUILDINGS, GROUNDS, AND UTILITIES</u>				(\$ 217,000)
	Equipment storage bldg. (150'x30')	sum	job		\$ 15,000
	Equipment maintenance bldg. (100'x30')	sum	job		15,000
	Administration building	sum	job		75,000
	Overlook building	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	5,800
	Subtotal				\$ 148,800
	Contingencies				22,200
	Subtotal for buildings, grounds, and utilities				\$ 171,000
	Operation and maintenance during construction, including contingencies				46,000
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 217,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 149,000)
	Ground maintenance equipment	sum	job		\$ 36,750
	Road maintenance equipment	sum	job		17,500
	Shop equipment	sum	job		15,400
	Miscellaneous equipment	sum	job		60,125
	Subtotal				\$ 129,775
	Contingencies				19,225
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 149,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 1,410,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 991,000
	TOTAL PROJECT COST (July 1963)				\$18,400,000

COST ESTIMATE - TRIBUTARY STREAM RESERVOIRS

**MERAMEC RIVER BASIN,
MISSOURI**

TABLE T-9
Cost estimate
Meramec River Basin, Missouri - Huzzah Creek Reservoir (I-14)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$1,130,000
02	Relocations	153,000
03	Reservoirs	49,000
04	Dams	3,483,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	444,000
14	Recreation facilities	50,000
19	Buildings, grounds, and utilities	181,000
20	Permanent operating equipment	75,000
30	Engineering and design	655,000
31	Supervision and administration	<u>417,000</u>
Total project cost (July 1963)		\$6,640,000

TABLE T-9
Cost estimate
Meramec River Basin, Missouri - Huzzah Creek Reservoir (I-14)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.-	<u>LANDS AND DAMAGES</u>				(\$1,130,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 829,000
.3	<u>U. S. Forest Service</u>				
	Total lands and damages, including contingencies	sum	job		<u>301,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$1,130,000
02.	<u>RELOCATIONS</u>				(\$ 153,000)
.3	<u>Cemeteries, Utilities and Structures</u>				
	Cemeteries, grave relocations	sum	job		<u>\$ 100,000</u>
	Subtotal for cemeteries				\$ 100,000
	Contingencies				<u>15,000</u>
	Total for cemeteries				\$ 115,000
	Utilities				
	Power line relocations	sum	job		\$ 21,700
	Telephone line relocations	sum	job		<u>11,300</u>
	Subtotal for utilities				\$ 33,000
	Contingencies				<u>5,000</u>
	Total for utilities				\$ 38,000
	Total for cemeteries, utilities and structures				\$ 153,000
	TOTAL FOR RELOCATIONS				\$ 153,000
03.	<u>RESERVOIRS</u>				(\$ 49,000)
	Clearing, untimbered	300	acre	25.00	\$ 7,500
	Clearing, timbered	200	acre	175.00	<u>35,000</u>
	Subtotal for reservoirs				\$ 42,500
	Contingencies				<u>6,500</u>
	TOTAL FOR RESERVOIRS				\$ 49,000

TABLE T-9 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
04.	DAMS				(\$3,483,000)
	Cofferdam, 1st stage				
	Embankment	66,100	cu.yd.	0.55	\$ 36,355
	Embankment removal	66,100	cu.yd.	0.25	16,525
	Unwatering	sum	job		30,000
	Care of water	sum	job		25,000
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		15,000
	Subtotal for cofferdams				\$ 148,880
	Spillway				
	Excavation, common	20,700	cu.yd.	0.45	\$ 9,315
	Excavation, core trench	1,600	cu.yd.	0.50	800
	Excavation, rock	11,400	cu.yd.	5.00	57,000
	Backfill, structures	3,600	cu.yd.	1.50	5,400
	Backfill, core trench, impervious material	1,600	cu.yd.	1.40	2,240
	Crushed stone, under stilling basin and chute floor	8,400	ton	5.00	42,000
	Riprap in exit channel	2,500	ton	6.00	15,000
	Bedding material in exit channel	1,650	ton	5.50	9,075
	Concrete, reinf., over-flow section	570	cu.yd.	45.00	25,650
	Concrete, reinf., abutment walls	510	cu.yd.	45.00	22,950
	Concrete, reinf., approach walls	1,100	cu.yd.	45.00	49,500
	Concrete, reinf., chute walls	8,300	cu.yd.	45.00	373,500
	Concrete, reinf., training walls	4,100	cu.yd.	45.00	184,500
	Concrete, reinf., wing walls	340	cu.yd.	45.00	15,300
	Concrete, lightly reinf., chute floor	1,800	cu.yd.	42.00	75,600
	Concrete, lightly reinf., stilling basin floor	840	cu.yd.	40.00	33,600

TABLE T-9 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
DAMS (Cont'd)					
	Steel, concrete reinforcing	2,500,000	lb.	0.15	\$ 375,000
	Drilling 1-1/2" dia. grout holes	500	lin.ft.	4.50	2,250
	Grout	500	cu.ft.	5.00	<u>2,500</u>
	Subtotal for spillway				\$1,301,180
Outlet works					
	Excavation, common	9,200	cu.yd.	0.45	\$ 4,140
	Excavation, approach and discharge channels	14,900	cu.yd.	0.50	7,450
	Excavation, rock	750	cu.yd.	5.00	3,750
	Backfill	4,600	cu.yd.	1.25	5,750
	Riprap, approach and discharge channels	280	ton	6.00	1,680
	Bedding material, approach and discharge channels	120	ton	5.50	660
	Concrete, mass, approach walls	40	cu.yd.	35.00	1,400
	Concrete, reinf. stilling basin	150	cu.yd.	45.00	6,750
	Concrete, reinf., conduit	1,950	cu.yd.	45.00	87,750
	Concrete, reinf., riser	30	cu.yd.	50.00	1,500
	Sluice gate, 36"x36", 50' head, complete	1	ea.	1,400.00	1,400
	Steel, concrete, reinforcing	319,000	lb.	0.15	47,850
	Generator, 2,500 W. and power wrench	sum	job		<u>2,100</u>
	Subtotal for outlet works				\$ 172,180
Earth dam					
	Stripping, foundation	47,000	cu.yd.	0.45	\$ 21,150
	Excavation, core trench	15,300	cu.yd.	0.50	7,650
	Excavation, inspection trench	2,400	cu.yd.	0.50	1,200
	Embankment impervious fill	160,000	cu.yd.	0.75	120,000
	Embankment, pervious fill	310,000	cu.yd.	0.65	201,500
	Embankment, random fill	480,000	cu.yd.	0.70	336,000

TABLE T-9 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	DAMS (Cont'd)				
	Sand drain	125,000	ton	3.50	\$ 437,500
	Riprap stone	18,700	ton	6.00	112,200
	Bedding material	7,800	ton	5.50	42,900
	Mulching, fertilizing and seeding dam slope	7	acre	200.00	1,400
	Road surfacing, A-3, w/ 10" stone base	4,370	sq.yd.	3.60	15,732
	Guardrail, steel w/ wood posts	3,280	lin.ft.	3.25	10,660
	Clearing, dam site	30	acre	175.00	5,250
	Drilling 1-1/2" dia. grout holes	7,800	lin.ft.	4.50	35,100
	Grout	7,800	cu.ft.	5.00	39,000
	Piezometers	24	ea.	270.00	6,480
	Subtotal for earth dam				\$1,393,722
	Subtotal for dams				\$ 3,015,962
	Contingencies				421,038
	Total for dams				\$3,437,000
	Operation & maintenance during construction, including contingencies				46,000
	TOTAL FOR DAMS				\$3,483,000
06.	FISH AND WILDLIFE FACILITIES				(\$ 3,000)
	Sluice gate, 30"x30", 50' head, complete	2	ea.	1,250.00	\$ 2,500
	Concrete, reinf., gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinf.	300	lb.	0.15	45
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				355
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000

TABLE T-9 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 444,000)
	A-1, South of Davisville on Highway V				
	Clearing & grubbing	30	acre	175.00	\$ 5,250
	Stripping	46,000	cu.yd.	0.45	20,700
	Excavation, class A	60,700	cu.yd.	1.00	60,700
	Seeding & fertilizing	20	acre	200.00	4,000
	Embankment, compacted	70,500	cu.yd.	0.75	52,875
	Machine grading-class I	80	station	110.00	8,800
	Fence, removal	9,600	lin.ft.	0.50	4,800
	Fence, 4-strand w/wood posts	29,000	lin.ft.	1.75	50,750
	Base material - type I	11,600	ton	4.00	46,400
	Guardrail, steel w/ wood posts	3,400	lin.ft.	3.25	11,050
	Bituminous, road mix (A-3)	32,900	sq.yd.	0.45	<u>14,805</u>
	Subtotal for A-1				\$ 280,130
	Local access roads, parking areas, grounds and guardrail	sum	job		\$ 70,000
	Storage & maintenance, parking & work areas:				
	Crushed stone	2,300	ton	5.00	11,500
	A-2 bituminous surfacing w/crushed stone base	4,800	sq.yd.	1.65	<u>7,920</u>
	Subtotal				\$ 369,550
	Contingencies				<u>55,950</u>
	Subtotal for roads, exclusive of right-of-way				\$ 425,500
	Right-of-way costs for A-1				\$ 6,500
	Total cost for roads				\$ 432,000
	Subtotal for roads, railroads and bridges				\$ 432,000
	Operation & maintenance during construction, including contingencies				<u>12,000</u>
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$ 444,000

TABLE T-9 (Cont'd)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
14.	RECREATION FACILITIES				(\$ 50,000)
	Picnic tables (PT-2)	10	ea.	55.00	\$ 550
	Picnic tables (PT-1 conc.)	10	ea.	75.00	750
	Concrete pads	10	ea.	150.00	1,500
	Barbecue Braziers	20	ea.	65.00	1,300
	Refuse containers (SR-1)	7	ea.	45.00	315
	Incinerators (SI-2)	1	ea.	300.00	300
	Comfort stations (SC-2)mod.	1	ea.	6,000.00	6,000
	Launching ramps	sum	job		15,000
	Signs	sum	job		385
	Parking areas	0.33	acre	15,000.00	5,000
	Access roads	0.60	mile	15,000.00	9,000
	Tent camp sites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		2,400
	Subtotal				\$ 43,500
	Contingencies				6,500
	TOTAL FOR RECREATION FACILITIES				\$ 50,000
19.	BUILDINGS, GROUNDS & UTILITIES				(\$ 181,000)
	Equipment storage bldg. (150'x30')	sum	job		\$ 10,000
	Equipment maintenance bldg. (100'x30')	sum	job		9,000
	Administration building	sum	job		75,000
	Overlook building	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	5,800
	Subtotal for buildings, grounds & utilities				\$ 137,800
	Contingencies				20,200
	Total for buildings, grounds & utilities				\$ 158,000
	Operation & maintenance during construction, including contingencies				23,000
	TOTAL FOR BUILDINGS, GROUNDS AND UTILITIES				\$ 181,000

TABLE T-9 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 75,000)
	Ground maintenance equipment	sum	job	\$	16,250
	Shop equipment	sum	job		12,500
	Miscellaneous equipment	sum	job		<u>36,400</u>
	Subtotal			\$	65,150
	Contingencies				<u>9,850</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 75,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 655,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 417,000
	TOTAL PROJECT COST (July 1963)				\$6,640,000

TABLE T-10
Cost estimate
Meramec River Basin, Missouri - Courtois Creek Reservoir (I-15A)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01 -	Lands and damages	\$ 545,000
02	Relocations	430,000
03	Reservoirs	46,000
04	Dams	3,556,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	787,000
14	Recreation facilities	100,000
19	Buildings, grounds, and utilities	182,000
20	Permanent operating equipment	74,000
30	Engineering and design	761,000
31	Supervision and administration	<u>466,000</u>
	Total project cost (July 1963)	\$6,950,000

TABLE T-10
Cost estimate
Meramec River Basin, Missouri - Courtois Creek Reservoir (I-15A)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.-	<u>LANDS AND DAMAGES</u>				(\$ 545,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 345,000
.3	<u>U. S. Forest Service</u>				
	Total lands and damages, including contingencies	sum	job		149,000
.4	Net value of mineral resources, including contingencies	sum	job		<u>51,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 545,000
02.	<u>RELOCATIONS</u>				(\$ 430,000)
.1	<u>Roads</u>				
	A-2, Access Road North of Brazil				
	Clearing and grubbing	7	acre	175.00	\$ 1,225
	Stripping	12,000	cu.yd.	0.45	5,400
	Excavation, class A	26,300	cu.yd.	1.00	26,300
	Seeding and fertilizing	5	acre	200.00	1,000
	Embankment, compacted	24,800	cu.yd.	0.75	18,600
	Fence, 4-strand w/ wood posts	9,000	lin.ft.	1.75	15,750
	Base material, type I	3,500	ton	4.50	15,750
	Surface aggregate, crushed stone	1,200	ton	5.00	6,000
	Concrete box culvert, 10'x12'x30'	sum	job		<u>1,900</u>
	Subtotal				\$ 91,925
	A-3 Access Road near Mallow School				
	Clearing and grubbing	20	acre	175.00	\$ 3,500
	Stripping	30,600	cu.yd.	0.45	13,770
	Seeding and fertilizing	20	acre	200.00	4,000
	Embankment, compacted	22,000	cu.yd.	0.75	16,500
	Machine grading, class I	60	station	110.00	6,600
	Fence, removal	16,200	lin.ft.	0.50	8,100
	Fence, 4-strand w/ wood posts	28,200	lin.ft.	1.75	49,350

TABLE T-10 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	<u>RELOCATIONS (Cont'd)</u>				
	Base material, type I	10,800	ton	4.50	\$ 48,600
	Surface aggregate, crushed stone	3,600	ton	5.00	<u>18,000</u>
	Subtotal				\$ 168,420
	Subtotal for township roads				\$ 260,345
	Contingencies				<u>39,155</u>
	Subtotal for township roads, exclusive of right-of-way				\$ 299,500
	Right-of-way costs:				
	Township road A-2				\$ 2,000
	Township road A-3				<u>3,500</u>
	Subtotal for right-of-way costs				\$ 5,500
	Total cost for township roads				\$ 305,000
	Subtotal for roads				\$ 305,000
	Operation and maintenance during construction, including contingencies				<u>7,000</u>
	Total for roads				\$ 312,000
.3	<u>Cemeteries, Utilities and Structures</u>				
	<u>Cemeteries</u>				
	Cemeteries, grave relo- cations	sum	job		<u>\$ 100,000</u>
	Subtotal for cemeteries				\$ 100,000
	Contingencies				<u>15,000</u>
	Total for cemeteries				\$ 115,000
	<u>Utilities</u>				
	Power line relocations	sum	job		\$ 1,500
	Telephone line relocations	sum	job		<u>1,300</u>
	Subtotal for utilities				\$ 2,800
	Contingencies				<u>200</u>

TABLE T-10 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>RELOCATIONS (Cont'd)</u>					
	Total for utilities				\$ 3,000
	Total for cemeteries, utilities and structures				\$ 118,000
	TOTAL FOR RELOCATIONS				\$ 430,000
03.	<u>RESERVOIRS</u>				(\$ 46,000)
	Clearing, untimbered	200	acre	25.00	\$ 5,000
	Clearing, timbered	200	acre	175.00	35,000
	Subtotal for reservoirs				\$ 40,000
	Contingencies				6,000
	TOTAL FOR RESERVOIRS				\$ 46,000
04.	<u>DAMS</u>				(\$3,556,000)
	Cofferdam, 1st stage				
	Embankment	108,000	cu.yd.	0.55	\$ 59,400
	Embankment removal	108,000	cu.yd.	0.25	27,000
	Unwatering	sum	job		35,000
	Care of water	sum	job		30,000
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		15,000
	Subtotal for cofferdams				\$ 192,400
	Spillway				
	Excavation, common	35,800	cu.yd.	0.45	\$ 16,110
	Excavation, core trench	1,600	cu.yd.	0.50	800
	Excavation, rock	1,400	cu.yd.	5.00	7,000
	Backfill, structures	4,350	cu.yd.	1.50	6,525
	Backfill, core trench, impervious material	1,600	cu.yd.	1.40	2,240
	Crushed stone, under stilling basin and chute floor	10,400	ton	5.00	52,000

TABLE T-10 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
DAMS (Cont'd)					
	Riprap in exit channel	2,500	ton	6.50	\$ 16,250
	Bedding material in exit channel	1,640	ton	5.50	9,020
	Concrete, reinf., overflow section	510	cu.yd.	45.00	22,950
	Concrete, reinf., abutment walls	500	cu.yd.	45.00	22,500
	Concrete, reinf., approach walls	1,030	cu.yd.	45.00	46,350
	Concrete, reinf., chute walls	5,100	cu.yd.	45.00	229,500
	Concrete, reinf., training walls	3,380	cu.yd.	45.00	152,100
	Concrete, reinf., wing walls	710	cu.yd.	45.00	31,950
	Concrete, lightly reinf., chute floor	2,440	cu.yd.	42.00	102,480
	Concrete, lightly reinf., stilling basin floor	740	cu.yd.	40.00	29,600
	Steel, concrete reinforcing	2,000,000	lb.	0.15	300,000
	Drilling 1-1/2" dia. grout holes	500	lin.ft.	4.50	2,250
	Grout	500	cu.ft.	5.00	2,500
	Subtotal for spillway				\$1,052,125
Outlet works					
	Excavation, common	8,600	cu.yd.	0.45	\$ 3,870
	Excavation, approach and discharge channels	14,900	cu.yd.	0.50	7,450
	Excavation, rock	720	cu.yd.	5.00	3,600
	Backfill	4,200	cu.yd.	1.25	5,250
	Riprap, approach and discharge channels	280	ton	6.50	1,820
	Bedding material, approach and discharge channels	120	ton	5.50	660
	Concrete, mass, approach walls	40	cu.yd.	35.00	1,400
	Concrete, reinf., stilling basin	150	cu.yd.	45.00	6,750

TABLE T-10 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>DAMS (Cont'd)</u>					
	Concrete, reinf., conduit	1,800	cu.yd.	45.00	\$ 81,000
	Concrete, reinf., riser	30	cu.yd.	50.00	1,500
	Sluice gate, 42"x42", 50' head, complete	1	ea.	2,000.00	2,000
	Steel, concrete, reinforcing	296,000	lb.	0.15	44,400
	Generator, 2,500 W. and power wrench	sum	job		<u>2,100</u>
	Subtotal for outlet works				\$ 161,800
<u>Earth dam</u>					
	Stripping, foundation	56,000	cu.yd.	0.45	\$ 25,200
	Excavation, core trench	14,900	cu.yd.	0.50	7,450
	Excavation, inspection trench	3,700	cu.yd.	0.50	1,850
	Embankment, impervious fill	179,000	cu.yd.	0.75	134,250
	Embankment, pervious fill	398,000	cu.yd.	0.65	258,700
	Embankment, random fill	503,000	cu.yd.	0.70	352,100
	Sand drain	150,000	ton	3.50	525,000
	Riprap stone	22,500	ton	6.50	146,250
	Bedding material	9,400	ton	5.50	51,700
	Mulching, fertilizing and seeding dam slope	8	acre	200.00	1,600
	Road surfacing, A-3, w/ 10" stone base	5,410	sq.yd.	3.60	19,476
	Guardrail, steel, w/ wood posts	4,060	lin.ft.	3.25	13,195
	Clearing, dam site	40	acre	175.00	7,000
	Drilling 1-1/2" dia. grout hole	9,500	lin.ft.	4.50	42,750
	Grout	9,500	cu.ft.	5.00	47,500
	Piezometers	30	ea.	270.00	<u>8,100</u>
	Subtotal for earth dam				\$1,642,121

TABLE T-10 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>DAMS (Cont'd)</u>					
	Subtotal for main dam				\$3,048,446
	Contingencies				<u>449,554</u>
	Total for main dam				\$3,498,000
	Operation and maintenance during construction including contingencies				<u>58,000</u>
	TOTAL FOR DAMS				\$3,556,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate, 30"x30", 50' head complete	2	ea.	1,250.00	\$ 2,500
	Concrete, reinf., gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinf.	300	lb.	0.15	<u>45</u>
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				<u>355</u>
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 787,000)
	A-1, Access Road to Dam				
	Clearing and grubbing	40	acre	175.00	\$ 7,000
	Stripping	76,000	cu.yd.	0.45	34,200
	Excavation, class A	58,400	cu.yd.	1.00	58,400
	Excavation, rock	12,100	cu.yd.	7.50	90,750
	Embankment, compacted	154,000	cu.yd.	0.75	115,500
	Machine grading, class I	70	station	110.00	7,700
	Machine grading, class II	170	station	150.00	25,500
	Seeding and fertilizing	30	acre	200.00	6,000
	Fence, 4-strand w/wood posts	52,200	lin.ft.	1.75	91,350

TABLE T-10 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
ROADS, RAILROADS AND BRIDGES (Cont'd)					
	Base material, type I	20,300	ton	4.50	\$ 91,350
	Guardrail, steel w/wood posts	2,200	lin.ft.	3.25	7,150
	Surface aggregate, crushed stone	6,700	ton	5.00	33,500
	Concrete box culvert 5'x8'x220'	sum	job		<u>6,000</u>
	Subtotal for A-1				\$ 574,400
	Local access roads, parking areas, grounds and guardrails	sum	job		\$ 70,000
	Storage and maintenance, parking and work areas:				
	crushed stone	2,300	ton	5.00	11,500
	A-2 bituminous surfacing w/crushed stone base	4,800	sq.yd.	1.65	<u>7,920</u>
	Subtotal				\$ 663,820
	Contingencies				<u>99,680</u>
	Subtotal for roads, exclusive of right-of-way				\$ 763,500
	Right-of-way cost for A-1				7,500
	Subtotal for roads, railroads and bridges				\$ 771,000
	Operation and maintenance during construction including contingencies				<u>16,000</u>
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$ 787,000

TABLE T-10 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
14.	RECREATION FACILITIES				(\$ 100,000)
	Picnic tables (PT-2)	20	ea.	55.00	\$ 1,100
	Picnic tables (PT-1 conc.)	20	ea.	75.00	1,500
	Concrete pads	20	ea.	150.00	3,000
	Barbecue braziers	40	ea.	65.00	2,600
	Refuse containers (SR-1)	14	ea.	45.00	630
	Incinerators (SI-2)	2	ea.	300.00	600
	Comfort stations (SC-2) mod.	2	ea.	6,000.00	12,000
	Launching ramps	sum	job		30,000
	Signs	sum	job		770
	Parking areas	0.67	acre	15,000.00	10,000
	Access roads	1.20	mile	15,000.00	18,000
	Tent camp sites	sum	job		2,000
	Wells w/pitcher pumps	sum	job		4,800
	Subtotal				\$ 87,000
	Contingencies				13,000
	TOTAL FOR RECREATION FACILITIES				\$ 100,000
19.	BUILDINGS, GROUNDS, AND UTILITIES				(\$ 182,000)
	Equipment storage bldg. (100'x30')	sum	job		\$ 10,000
	Equipment maintenance bldg. (50'x30')	sum	job		9,000
	Administration building	sum	job		75,000
	Overlook building	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	5,800
	Subtotal				\$ 137,800
	Contingencies				21,200
	Subtotal for buildings, grounds, and utilities				\$ 159,000
	Operation and maintenance during construction, including contingencies				23,000
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 182,000

TABLE T-10 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 74,000)
	Fire Fighting equipment	sum	job		-----
	Ground maintenance equip- ment	sum	job		15,750
	Shop equipment	sum	job		12,000
	Miscellaneous equipment	sum	job		<u>36,400</u>
	Subtotal				\$ 64,150
	Contingencies				<u>9,850</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 74,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 761,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 466,000
	TOTAL PROJECT COST (July 1963)				\$6,950,000

TABLE T-11
Cost estimate
Meramec River Basin, Missouri - Peavine Creek Reservoir (I-21)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 265,000
02	Relocations	256,000
03	Reservoirs	32,000
04	Dams	1,557,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	228,000
14	Recreation facilities	50,000
19	Buildings, grounds, and utilities	182,000
20	Permanent operating equipment	74,000
30	Engineering and design	527,000
31	Supervision and administration	<u>266,000</u>
	Total project cost (July 1963)	\$3,440,000

TABLE T-11
Cost estimate
Meramec River Basin, Missouri - Peavine Creek Reservoir (I-21)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.-	<u>LANDS AND DAMAGES</u>				(\$ 265,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 228,000
.2	<u>Bureau of Outdoor Recreation</u>				
	Total lands and damages, including contingencies	sum	job		<u>37,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 265,000
02.	<u>RELOCATIONS</u>				(\$ 256,000)
.1	<u>Roads</u>				
	S-1, State Highway F. at Peavine Creek				
	Clearing and grubbing	7	acre	175.00	\$ 1,225
	Stripping	11,400	cu.yd.	0.45	5,130
	Seeding and fertilizing	4	acre	200.00	800
	Embankment, compacted	29,800	cu.yd.	0.75	22,350
	Base material, type I	1,610	ton	3.50	5,635
	Guardrail, steel w/ wood posts	4,100	lin.ft.	3.25	13,325
	Bituminous road mix (A-3)	4,100	sq.yd.	0.45	1,845
	Concrete box culvert	130	lin.ft.	66.15	8,600
	Riprap	1,400	ton	5.50	7,700
	Bedding material	760	ton	5.00	3,800
	Bridge removal lower Peavine Creek	sum	job		4,000
	Bridge over Peavine Creek	sum	job		<u>34,000</u>
	Subtotal for state roads				\$ 108,410
	Contingencies				<u>16,590</u>
	Subtotal for state roads, exclusive of right-of-way				\$ 125,000
	Right-of-way costs				None
	Total for state roads				\$ 125,000

TABLE T-11 (Cont'd)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
RELOCATIONS (Cont'd)					
	Operation and maintenance during construction, including contingencies				\$ 6,000
	Total for roads				\$ 131,000
.3	Cemeteries, Utilities and Structures				
	Cemeteries				
	Cemeteries, grave relocations	sum	job		\$ 100,000
	Subtotal for cemeteries				\$ 100,000
	Contingencies				15,000
	Total for cemeteries				\$ 115,000
	Utilities				
	Power line relocations	sum	job		\$ 5,800
	Telephone line relo- cations	sum	job		3,100
	Subtotal for utilities				\$ 8,900
	Contingencies				1,100
	Total for utilities				\$ 10,000
	Total for cemeteries, utilities and structures				\$ 125,000
	TOTAL FOR RELOCATIONS				\$ 256,000
03.	RESERVOIRS				(\$ 32,000)
	Bridge removal, upper Peavine Creek	sum	job		\$ 5,000
	Clearing, untimbered	200	acre	25.00	5,000
	Clearing, timbered	100	acre	175.00	17,500
	Subtotal for reservoirs				\$ 27,500
	Contingencies				4,500
	TOTAL FOR RESERVOIRS				\$ 32,000

TABLE T-11 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
04.	<u>DAMS</u>				(\$1,557,000)
	Cofferdam, 1st stage				
	Embankment	52,400	cu.yd.	0.55	\$ 28,820
	Embankment removal	52,400	cu.yd.	0.25	13,100
	Unwatering	sum	job		30,000
	Care of water	sum	job		25,000
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		<u>15,000</u>
	Subtotal for cofferdams				\$ 137,920
	Spillway				
	Excavation, structural	150	cu.yd.	2.50	\$ 375
	Concrete, reinf., cutoff wall	180	cu.yd.	45.00	8,100
	Concrete, lightly reinf., slab	1,450	cu.yd.	42.00	60,900
	Steel, concrete reinforcing	75,500	lb.	0.15	<u>11,325</u>
	Subtotal for spillway				\$ 80,700
	Outlet works				
	Excavation, common	5,100	cu.yd.	0.45	\$ 2,295
	Excavation, approach and discharge channels	13,500	cu.yd.	0.50	6,750
	Excavation, rock	240	cu.yd.	5.00	1,200
	Backfill	3,500	cu.yd.	1.25	4,375
	Riprap, approach and discharge channels	270	ton	5.50	1,485
	Bedding material, approach and discharge channels	120	ton	5.00	600
	Concrete, mass, approach walls	50	cu.yd.	35.00	1,750
	Concrete, reinf., stilling basin	100	cu.yd.	45.00	4,500
	Concrete, reinf., conduit	500	cu.yd.	45.00	<u>22,500</u>

TABLE T-11 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>DAMS (Cont'd)</u>					
	Concrete, reinf., riser	10	cu.yd.	50.00	\$ 500
	Sluice gate, 20"x20", 30' head, complete	1	ea.	600.00	600
	Steel, concrete, reinforcing	93,500	lb.	0.15	14,025
	Generator, 2,500 W. and power wrench	sum	job		<u>2,100</u>
	Subtotal for outlet works				\$ 62,680
Earth dam					
	Stripping, foundation	40,200	cu.yd.	0.45	\$ 18,090
	Excavation, core trench	16,000	cu.yd.	0.50	8,000
	Excavation, inspection trench	3,200	cu.yd.	0.50	1,600
	Excavation, grass spillway	552,000	cu.yd.	0.45	248,400
	Backfill, grass spillway w/topsoil	6,100	cu.yd.	0.80	4,880
	Embankment, impervious from spillway	321,000	cu.yd.	0.45	144,450
	Embankment, random from spillway	96,000	cu.yd.	0.40	38,400
	Sand drain	75,800	ton	4.00	303,200
	Riprap	16,300	ton	5.50	89,650
	Bedding Material	6,800	ton	5.00	34,000
	Mulching, fertilizing and seeding dam slope	6	acre	200.00	1,200
	Mulching, fertilizing and seeding grass spillway area	20	acre	200.00	4,000
	Road surfacing, A-3, w/10" stone base	6,750	sq.yd.	3.60	24,300
	Guardrail, steel w/ wood posts	5,060	lin.ft.	3.25	16,445
	Clearing, dam and grass spillway sites	80	acre	175.00	14,000
	Drilling 1-1/2" dia. grout holes	6,400	lin.ft.	4.50	28,800
	Grout	6,400	cu.ft.	5.00	32,000
	Piezometers	39	ea.	270.00	<u>10,530</u>
	Subtotal for earth dam				\$1,021,945

TABLE T-11 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
DAMS (Cont'd)					
	Subtotal for main dam				\$1,303,245
	Contingencies				<u>195,755</u>
	Total for main dam				\$1,499,000
	Operation and maintenance during construction, including contingencies				<u>58,000</u>
	TOTAL FOR DAMS				\$1,557,000
06.	FISH AND WILDLIFE FACILITIES				(\$ 3,000)
	Sluice gate, 30"x30", 50' head, complete	2	ea.	1,250.00	\$ 2,500
	Concrete, reinf., gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinf.	300	lb.	0.15	<u>45</u>
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				<u>355</u>
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000
08.	ROADS, RAILROADS AND BRIDGES				(\$ 228,000)
	A-1, Across Dam to Connect Highway "F"				
	Clearing and grubbing	10	acre	175.00	\$ 1,750
	Stripping	21,400	cu.yd.	0.45	9,630
	Excavation, class A	21,200	cu.yd.	1.00	21,200
	Seeding and fertilizing	9	acre	200.00	1,800
	Machine grading, class I	50	station	110.00	5,500
	Fence, 4-strand w/wood posts	16,400	lin.ft.	1.75	28,700
	Base material, type I	6,300	ton	3.50	22,050
	Bituminous, road mix (A-3)	18,200	sq.yd.	0.45	<u>8,190</u>
	Subtotal for A-1				\$ 98,820
	Local access roads, parking areas, grounds and guard- rail	sum	job		\$ 70,000
	Storage and maintenance, parking and work areas:				

TABLE T-11 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>ROADS, RAILROADS AND BRIDGES (Cont'd)</u>					
	Crushed stone	2,300	ton	4.50	\$ 10,350
	A-2 bituminous sur- facing w/crushed stone base	4,800	sq.yd.	1.65	<u>7,920</u>
	Subtotal				\$ 187,090
	Contingenceis				<u>28,710</u>
	Subtotal for roads, exclusive of right-of-way				\$ 215,800
	Right-of-way cost				<u>6,200</u>
	Subtotal for roads, railroads and bridges				\$ 222,000
	Operation and maintenance during construction, including contingencies				<u>6,000</u>
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$ 228,000
14.	<u>RECREATION FACILITIES</u>				(\$ 50,000)
	Picnic tables (PT-2)	10	ea.	55.00	\$ 550
	Picnic tables (PT-1 conc.)	10	ea.	75.00	750
	Concrete pads	10	ea.	150.00	1,500
	Barbecue braziers	20	ea.	65.00	1,300
	Refuse containers (SR-1)	7	ea.	45.00	315
	Incinerators (SI-2)	1	ea.	300.00	300
	Comfort stations (SC-2) Mod.	1	ea.	6,000.00	6,000
	Launching ramps	sum	job		15,000
	Signs	sum	job		385
	Parking areas	0.33	acre	15,000.00	5,000
	Access roads	0.60	mile	15,000.00	9,000
	Tent campsites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		<u>2,400</u>
	Subtotal				\$ 43,500
	Contingencies				<u>6,500</u>
	TOTAL FOR RECREATION FACILITIES				\$ 50,000

TABLE T-11 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
19.	<u>BUILDINGS, GROUNDS AND UTILITIES</u>				(\$ 182,000)
	Equipment storage bldg. (100'x30')	sum	job		\$ 10,000
	Equipment maintenance bldg. (50'x30')	sum	job		9,000
	Administration building	sum	job		75,000
	Overlook building	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin. ft.	2.90	5,800
	Subtotal				\$ 137,800
	Contingencies				21,200
	Subtotal for buildings, grounds and utilities				\$ 159,000
	Operation and maintenance during construction, including contingencies				23,000
	TOTAL FOR BUILDINGS, GROUNDS AND UTILITIES				\$ 182,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 74,000)
	Ground maintenance equip- ment	sum	job		\$ 15,750
	Shop equipment	sum	job		12,000
	Miscellaneous equipment	sum	job		36,400
	Subtotal				\$ 64,150
	Contingencies				9,850
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 74,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 527,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 266,000
	TOTAL PROJECT COST (July 1963)				\$3,440,000

TABLE T-12
Cost estimate

Meramec River Basin, Missouri - Little Dry Fork Creek Reservoir (I-23)

Classifi-
cation
No.

Item

Cost

01	Lands and damages	\$ 520,000
02	Relocations	236,000
03	Reservoirs	35,000
04	Dams	2,490,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	127,000
14	Recreation facilities	173,000
19	Buildings, grounds and utilities	182,000
20	Permanent operating equipment	74,000
30	Engineering and design	677,000
31	Supervision and administration	<u>353,000</u>
	Total project cost (July 1963)	\$4,870,000

TABLE T-12
Cost estimate
Meramec River Basin, Missouri - Little Dry Fork Creek Reservoir (I-23)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.	<u>LANDS AND DAMAGES</u>				(\$ 520,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 309,000
.2	<u>Bureau of Outdoor Recreation</u>				
	Total lands and damages, including contingencies	sum	job		<u>211,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 520,000
02.	<u>RELOCATIONS</u>				(\$ 236,000)
.1	<u>Roads</u>				
	S-1, State Road, Phelps County				
	Clearing and grubbing	2	acre	175.00	\$ 350
	Stripping	10,800	sq.yd.	0.45	4,860
	Seeding and fertilizing	0.5	acre	200.00	100
	Embankment, compacted	41,100	cu.yd.	0.70	28,770
	Base material, type II	340	cu.yd.	4.50	1,530
	Guardrail, steel w/ wood posts	1,000	lin.ft.	3.25	3,250
	Riprap	2,300	ton	6.00	13,800
	Bedding material	1,200	ton	5.50	6,600
	Bridge over Daily Branch	sum	job		<u>30,000</u>
	Subtotal				\$ 89,260
	Subtotal for state roads				\$ 89,260
	Contingencies				<u>13,740</u>
	Subtotal for state roads, exclusive of right-of-way				\$ 103,000
	Right-of-way cost				<u>None</u>
	Total cost for state roads				\$ 103,000
	Subtotal for roads				\$ 103,000
	Operation and maintenance during construction, including contingencies				<u>2,000</u>
	Total for roads				\$ 105,000

TABLE T-12 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
.3	<u>Cemeteries, Utilities, and Structures</u>				
	<u>Cemeteries</u>				
	Cemeteries, grave relocations	sum	job		\$ 100,000
	Subtotal for cemeteries				\$ 100,000
	Contingencies				15,000
	Total for cemeteries				\$ 115,000
	<u>Utilities</u>				
	Power line relocations	sum	job		\$ 8,600
	Telephone line relocations	sum	job		5,000
	Subtotal for utilities				\$ 13,600
	Contingencies				2,400
	Total for utilities				\$ 16,000
	Total for cemeteries, utilities and structures				\$ 131,000
	TOTAL FOR RELOCATIONS				\$ 236,000
03.	RESERVOIRS				(\$ 35,000)
	Bridge removal over Dry Fork	sum	job		\$ 7,500
	Clearing, untimbered	200	acre	25.00	5,000
	Clearing, timbered	100	acre	175.00	17,500
	Subtotal for reservoirs				\$ 30,000
	Contingencies				5,000
	TOTAL FOR RESERVOIRS				\$ 35,000

TABLE T-12 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
04.	<u>DAMS</u>				(\$2,490,000)
	Cofferdam, 1st stage				
	Embankment	52,800	cu.yd.	0.55	\$ 29,040
	Embankment removal	52,800	cu.yd.	0.25	13,200
	Unwatering	sum	job		35,000
	Care of water	sum	job		30,000
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		<u>15,000</u>
	Subtotal for cofferdams				\$ 148,240
	Spillway				
	Excavation, common	13,300	cu.yd.	0.45	\$ 5,985
	Excavation, core trench	1,600	cu.yd.	0.50	800
	Excavation, rock	9,400	cu.yd.	5.00	47,000
	Backfill, structures	2,600	cu.yd.	1.50	3,900
	Backfill, core trench, impervious material	1,600	cu.yd.	1.40	2,240
	Crushed stone, under stilling basin and chute floor	5,600	ton	5.00	28,000
	Riprap in exit channel	2,120	ton	6.00	12,720
	Bedding material in exit channel	1,400	ton	5.50	7,700
	Concrete, reinf., overflow section	240	cu.yd.	45.00	10,800
	Concrete, reinf., abutment walls	310	cu.yd.	45.00	13,950
	Concrete, reinf., approach walls	550	cu.yd.	45.00	24,750
	Concrete, reinf., chute walls	3,400	cu.yd.	45.00	153,000
	Concrete, reinf., training walls	2,100	cu.yd.	45.00	94,500
	Concrete, reinf., wing walls	90	cu.yd.	45.00	4,050
	Concrete, lightly reinf., chute floor	1,300	cu.yd.	42.00	54,600
	Concrete, lightly reinf., stilling basin floor	450	cu.yd.	40.00	18,000

TABLE T-12 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>DAMS (Cont'd)</u>					
	Steel, concrete reinforcing	1,160,000	lb.	0.15	\$ 174,000
	Drilling 1-1/2" dia. grout holes	500	lin.ft.	4.50	2,250
	Grout	500	cu.ft.	5.00	<u>2,500</u>
	Subtotal for spillway				\$ 660,745
Outlet works					
	Excavation, common	7,000	cu.yd.	0.45	\$ 3,150
	Excavation, approach and discharge channels	13,500	cu.yd.	0.50	6,750
	Excavation, rock	420	cu.yd.	5.00	2,100
	Backfill	4,900	cu.yd.	1.25	6,125
	Riprap, approach and discharge channels	270	ton	6.00	1,620
	Bedding material, approach and discharge channels	120	ton	5.50	660
	Concrete, mass, approach walls	50	cu.yd.	35.00	1,750
	Concrete, reinf., stilling basin	100	cu.yd.	45.00	4,500
	Concrete, reinf., conduit	850	cu.yd.	45.00	38,250
	Concrete, reinf., riser	20	cu.yd.	50.00	1,000
	Sluice gate, 21"x21", 30' head, complete	1	ea.	800.00	800
	Steel, concrete reinforcing	145,000	lb.	0.15	21,750
	Generator, 2,500 W. and power wrench				<u>2,100</u>
	Subtotal for outlet works				\$ 90,555
Earth dam					
	Stripping, foundation	58,300	cu.yd.	0.45	\$ 26,235
	Excavation, core trench	13,000	cu.yd.	0.50	6,500
	Excavation, inspection trench	5,900	cu.yd.	0.50	2,950
	Embankment, impervious fill	640,000	cu.yd.	0.75	480,000
	Embankment, random fill	200,000	cu.yd.	0.70	140,000
	Sand drain	95,000	ton	2.50	237,500

TABLE T-12 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	<u>DAMS (Cont'd)</u>				
	Riprap	22,000	ton	6.00	\$ 132,000
	Bedding material	9,400	ton	5.50	51,700
	Mulching, fertilizing and seeding, dam slope	8	acre	200.00	1,600
	Road surfacing, A-3,w/ 10" stone base	8,450	sq.yd.	3.60	30,420
	Guardrail, steel w/ wood posts	6,340	lin.ft.	3.25	20,605
	Clearing, dam site	50	acre	175.00	8,750
	Drilling 1-1/2" dia. grout holes	8,700	lin.ft.	4.50	39,150
	Grout	8,700	cu.ft.	5.00	43,500
	Piezometers	48	ea.	270.00	12,960
	Subtotal for earth dam				\$1,233,870
	Subtotal for main dam				\$ 2,133,410
	Contingencies				<u>293,590</u>
	Total for main dam				\$2,427,000
	Operation and maintenance during construction including contingencies				<u>63,000</u>
	TOTAL FOR DAMS				\$2,490,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate, 30"x30", 50' head, complete	2	ea.	1,250.00	\$ 2,500
	Concrete, reinf., gate structure	2	cu.yd.	50.00	100
	Steel, concrete, reinf.	300	lb.	0.15	<u>45</u>
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				<u>355</u>
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000

TABLE T-12 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
08.	<u>ROADS, RAILROADS, AND BRIDGES</u>				(\$ 127,000)
	A-1, From Dam to County Road				
	Clearing and grubbing	2	acre	175.00	\$ 350
	Stripping	3,630	cu.yd.	0.45	1,634
	Seeding and fertilizing	2	acre	200.00	400
	Machine grading, class I	20	station	110.00	2,200
	Fence, 4-strand w/wood posts	2,800	lin.ft.	1.75	4,900
	Base material, type I	1,120	ton	4.00	4,480
	Bituminous road mix (A-3)	3,100	sq.yd.	0.45	<u>1,395</u>
	Subtotal for A-1				\$ 15,359
	Local access roads, parking areas, grounds, and guardrail	sum	job		\$ 70,000
	Storage and maintenance parking and work areas:				
	Crushed stone	2,300	ton	5.00	11,500
	A-2 bituminous sur- facing w/crushed stone base	4,800	sq.yd.	1.65	<u>7,920</u>
	Subtotal				\$ 104,779
	Contingencies				<u>16,221</u>
	Subtotal for roads, exclusive of right- of-way				\$ 121,000
	Right-of-way cost				<u>None</u>
	Subtotal for roads, railroads, and bridges				\$ 121,000
	Operation and maintenance during construction, including contingencies				<u>6,000</u>
	TOTAL FOR ROADS, RAILROADS, AND BRIDGES				\$ 127,000

TABLE T-12 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
14.	RECREATION FACILITIES				(\$ 173,000)
	Picnic tables (PT-2)	20	ea.	55.00	\$ 1,100
	Picnic tables (PT-1 conc.)	25	ea.	75.00	1,875
	Concrete pads	40	ea.	150.00	6,000
	Barbecue braziers	45	ea.	65.00	2,925
	Refuse containers (SR-1)	25	ea.	45.00	1,125
	Incinerators (SI-2)	5	ea.	300.00	1,500
	Comfort stations (SC-1)	1	ea.	8,000.00	8,000
	Comfort stations (SC-2) mod.	1	ea.	6,000.00	6,000
	Shelters (PS-1)	1	ea.	2,300.00	2,300
	Sewage treatment system	1	ea.	8,000.00	8,000
	Sewage lines	sum	job		1,500
	Wells w/pressure tanks	1	ea.	10,000.00	10,000
	Water distribution lines	sum	job		5,200
	Fountains and hydrants	5	ea.	900.00	4,500
	Dry wells	5	ea.	500.00	2,500
	Launching ramps	sum	job		30,000
	Signs	sum	job		1,500
	Parking areas	0.75	acre	15,000.00	11,250
	Access roads	1.25	mile	15,000.00	18,750
	Paths	0.50	mile	8,000.00	4,000
	Sand blanket	sum	job		12,975
	Trees	20	ea.	30.00	600
	Seeding, mulching and fertilizing	30	acre	160.00	4,800
	Tent camp sites	sum	job		4,000
	Subtotal				\$ 150,400
	Contingencies				22,600
	TOTAL FOR RECREATION FACILITIES				\$ 173,000

TABLE T-12 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
19.	<u>BUILDINGS, GROUNDS, AND UTILITIES</u>				(\$ 182,000)
	Equipment storage bldg. (100'x30')	sum	job		\$ 10,000
	Equipment maintenance bldg. (50'x30')	sum	job		9,000
	Administration building	sum	job		75,000
	Overlook building	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	<u>5,800</u>
	Subtotal				\$ 137,800
	Contingencies				<u>21,200</u>
	Subtotal for buildings, grounds, and utilities				\$ 159,000
	Operation and maintenance during construction, including contingencies				<u>23,000</u>
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 182,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 74,000)
	Ground maintenance equipment	sum	job		\$ 15,750
	Shop equipment	sum	job		12,000
	Miscellaneous equipment	sum	job		<u>36,400</u>
	Subtotal				\$ 64,150
	Contingencies				<u>9,850</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 74,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 677,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 353,000
	TOTAL PROJECT COST (July 1963)				\$4,870,000

TABLE T-13
Cost estimate
Meramec River Basin, Missouri - West Fork Huzzah Creek Reservoir (I-26)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 247,000
02	Relocations	320,000
03	Reservoirs	32,000
04	Dams	2,308,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	160,000
14	Recreation facilities	50,000
19	Buildings, grounds, and utilities	182,000
20	Permanent operating equipment	74,000
30	Engineering and design	578,000
31	Supervision and administration	<u>326,000</u>
Total project cost (July 1963)		\$4,280,000

TABLE T-13
Cost estimate
Meramec River Basin, Missouri - West Fork Huzzah Creek Reservoir (I-26)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.-	<u>LANDS AND DAMAGES</u>				(\$ 247,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		<u>\$ 247,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 247,000
02.	<u>RELOCATIONS</u>				(\$ 320,000)
.1	<u>Roads</u>				
	C-1, County Road south of Dam				
	Clearing and grubbing	8	acre	175.00	\$ 1,400
	Stripping	39,500	cu.yd.	0.45	17,775
	Excavation, class A	5,800	cu.yd.	1.00	5,800
	Seeding and fertilizing	8	acre	200.00	1,600
	Embankment, compacted	9,770	cu.yd.	0.75	7,328
	Machine grading, class				
	I	102	station	110.00	11,220
	Fence, removal	2,100	lin.ft.	0.50	1,050
	Fence, 4-strand w/ wood posts	16,200	lin.ft.	1.75	28,350
	Base material, type				
	II	3,500	ton	4.50	15,750
	Guardrail, steel w/ wood posts	1,000	lin.ft.	3.25	3,250
	Surface aggregate, crushed stone	2,600	ton	5.00	13,000
	Bridge over West Fork Huzzah Creek	sum	job		<u>50,000</u>
	Subtotal for county roads				\$ 156,523
	Contingencies				<u>23,477</u>
	Subtotal for county roads, exclusive of right-of-way				\$ 180,000
	Right-of-way cost for C-1				<u>4,000</u>
	Total cost for county roads				\$ 184,000
	Subtotal for roads				\$ 184,000
	Operation and maintenance during construction, including contingencies				<u>5,000</u>
	TOTAL FOR ROADS				\$ 189,000

TABLE T-13 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>RELOCATIONS (Cont'd)</u>					
.3	<u>Cemeteries, Utilities, and Structures</u>				
	<u>Cemeteries</u>				
	Cemeteries, grave relocations	sum	job		\$ 100,000
	Subtotal for cemeteries				\$ 100,000
	Contingencies				15,000
	Total for cemeteries				\$ 115,000
	<u>Utilities</u>				
	Power line relocations				\$ 8,500
	Telephone line relocations				5,000
	Subtotal for utilities				\$ 13,500
	Contingencies				2,500
	Total for utilities				\$ 16,000
	Total for cemeteries, utilities, and structures				\$ 131,000
	TOTAL FOR RELOCATIONS				\$ 320,000
03.	<u>RESERVOIRS</u>				(\$ 32,000)
	Clearing, untimbered	400	acre	25.00	\$ 10,000
	Clearing, timbered	100	acre	175.00	17,500
	Subtotal for reservoirs				\$ 27,500
	Contingencies				4,500
	TOTAL FOR RESERVOIRS				\$ 32,000

TABLE T-13 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
04.	<u>DAMS</u>				(\$2,308,000)
	Cofferdam, 1st stage				
	Embankment	48,500	cu.yd.	0.55	\$ 26,675
	Embankment removal	48,500	cu.yd.	0.25	12,125
	Unwatering	sum	job		30,000
	Care of water	sum	job		25,000
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		15,000
	Subtotal for cofferdams				\$ 134,800
	Spillway				
	Excavation, common	20,200	cu.yd.	0.45	\$ 9,090
	Excavation, core trench	1,600	cu.yd.	0.50	800
	Excavation, rock	5,500	cu.yd.	5.00	27,500
	Backfill, structures	3,050	cu.yd.	1.50	4,575
	Backfill, core trench, impervious material	1,600	cu.yd.	1.40	2,240
	Crushed stone, under stilling basin and chute floor	7,000	ton	5.00	35,000
	Riprap in exit channel	2,120	ton	6.00	12,720
	Bedding material in exit channel	1,400	ton	5.50	7,700
	Concrete, reinf., overflow section	150	cu.yd.	45.00	6,750
	Concrete, reinf., abutment walls	250	cu.yd.	45.00	11,250
	Concrete, reinf., approach walls	330	cu.yd.	45.00	14,850
	Concrete, reinf., chute walls	3,050	cu.yd.	45.00	137,250
	Concrete, reinf., training walls	1,720	cu.yd.	45.00	77,400
	Concrete, reinf., wing walls	550	cu.yd.	45.00	24,750
	Concrete, lightly reinf., chute floor	2,000	cu.yd.	42.00	84,000
	Concrete, lightly reinf., stilling basin floor	350	cu.yd.	40.00	14,000

TABLE T-13 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>DAMS (Cont'd)</u>					
	Steel, concrete reinforcing	1,120,000	lb.	0.15	\$ 168,000
	Drilling 1-1/2" diameter, grout holes	500	lin.ft.	4.50	2,250
	Grout	500	cu.ft.	5.00	<u>2,500</u>
	Subtotal for spillway				\$ 642,625
	Outlet works				
	Excavation, common	8,500	cu.yd.	0.45	\$ 3,825
	Excavation, approach and discharge channels	13,500	cu.yd.	0.50	6,750
	Excavation, rock	380	cu.yd.	5.00	1,900
	Backfill	6,100	cu.yd.	1.25	7,625
	Riprap, approach and discharge channels	270	ton	6.00	1,620
	Bedding material, approach and discharge channels	120	ton	5.50	660
	Concrete, mass, approach walls	50	cu.yd.	35.00	1,750
	Concrete, reinf., stilling basin	100	cu.yd.	45.00	4,500
	Concrete, reinf., conduit	1,000	cu.yd.	45.00	45,000
	Concrete, reinf., riser	90	cu.yd.	50.00	4,500
	Sluice gate, 18"x18", 100' head, complete	1	each	1,000.00	1,000
	Steel, concrete reinforcing	175,000	lb.	0.15	26,250
	Generator, 2,500 W. and power wrench	sum	job		<u>2,100</u>
	Subtotal for outlet works				\$ 107,480

TABLE T-13 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
DAMS (Cont'd)					
	Earth dam				
	Stripping, foundation	41,700	cu.yd.	0.45	\$ 18,765
	Excavation, core trench	15,300	cu.yd.	0.50	7,650
	Excavation, inspection trench	1,900	cu.yd.	0.50	950
	Embankment, impervious fill	159,000	cu.yd.	0.75	119,250
	Embankment, pervious fill	353,000	cu.yd.	0.65	229,450
	Embankment, random fill	469,000	cu.yd.	0.70	328,300
	Sand drain	113,000	ton	2.00	226,000
	Riprap	9,000	ton	6.00	54,000
	Bedding material	3,800	ton	5.50	20,900
	Mulching, fertilizing and seeding dam slope	10	acre	200.00	2,000
	Road surfacing, A-3, w/10" stone base	3,520	sq.yd.	3.60	12,672
	Guardrail, steel w/ wood posts	2,640	lin.ft.	3.25	8,580
	Clearing, dam site	30	acre	175.00	5,250
	Drilling 1-1/2" diameter grout holes	6,800	lin.ft.	4.50	30,600
	Grout	6,800	cu.ft.	5.00	34,000
	Piezometers	21	each	270.00	5,670
	Subtotal for earth dam				\$1,104,037
	Subtotal for main dam				\$1,988,942
	Contingencies				273,058
	Total for main dam				\$2,262,000
	Operation and maintenance during construction, including contingencies				46,000
	TOTAL FOR DAMS				\$2,308,000

TABLE T-13 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate, 30"x30", 50' head, complete	2	each	1,250.00	\$ 2,500
	Concrete, reinf., gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinf.	300	lb.	0.15	45
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				355
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000
08.	<u>ROADS, RAILROADS, AND BRIDGES</u>				(\$ 160,000)
	A-1, access road to spillway area				
	Clearing and grubbing	3	acre	175.00	\$ 525
	Stripping	3,100	cu.yd.	0.45	1,395
	Excavation, class A	9,800	cu.yd.	1.00	9,800
	Excavation, rock	2,300	cu.yd.	7.50	17,250
	Seeding and fertilizing	3	acre	200.00	600
	Embankment, compacted	2,700	cu.yd.	0.75	2,025
	Machine grading, class I	9	station	110.00	990
	Machine grading, class II	3	station	150.00	450
	Base material, type I	1,100	ton	4.00	4,400
	Surface aggregate, crushed stone	800	ton	4.50	3,600
	Guardrail, steel w/ wood posts	900	lin.ft.	3.25	2,925
	Subtotal for A-1				\$ 43,960
	Local access roads, parking areas, grounds, and guardrail	sum	job		\$ 70,000
	Storage and maintenance parking and work areas:				
	Crushed stone	2,300	ton	5.00	11,500
	A-2 bituminous surfacing w/ crushed stone base	4,800	sq.yd.	1.65	7,920
	Subtotal				\$ 133,380
	Contingencies				19,620

TABLE T-13 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>ROADS, RAILROADS, AND BRIDGES (Cont'd)</u>					
	Subtotal for roads, exclusive of right-of-way				\$ 153,000
	Right-of-way cost				<u>2,000</u>
	Subtotal for roads, railroads, and bridges				\$ 155,000
	Operation and maintenance during construction, including contingencies				<u>5,000</u>
	TOTAL FOR ROADS, RAILROADS, AND BRIDGES				\$ 160,000
14.	<u>RECREATION FACILITIES</u>				(\$ 50,000)
	Picnic tables (PT-2)	10	each	55.00	\$ 550
	Picnic tables (PT-1 concrete)	10	each	75.00	750
	Concrete pads	10	each	150.00	1,500
	Barbecue braziers	20	each	65.00	1,300
	Refuse containers(SR-1)	7	each	45.00	315
	Incinerators (SI-2)	1	each	300.00	300
	Comfort stations (SC-2) mod.	1	each	6,000.00	6,000
	Launching ramps	sum	job		15,000
	Signs	sum	job		385
	Parking areas	0.33	acre	15,000.00	5,000
	Access roads	0.60	mile	15,000.00	9,000
	Tent campsites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		<u>2,400</u>
	Subtotal				\$ 43,500
	Contingencies				<u>6,500</u>
	TOTAL FOR RECREATION FACILITIES				\$ 50,000

TABLE T-13 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
19.	<u>BUILDINGS, GROUNDS, AND UTILITIES</u>				(\$ 182,000)
	Equipment storage bldg. (100'x30')	sum	job		\$ 10,000
	Equipment maintenance bldg. (50'x30')	sum	job		9,000
	Administration bldg.	sum	job		75,000
	Overlook bldg.	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	5,800
	Subtotal				\$ 137,800
	Contingencies				21,200
	Subtotal for buildings, grounds, and utilities				\$ 159,000
	Operation and maintenance during construction, including contingencies				23,000
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 182,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 74,000)
	Fire fighting equipment	sum	job		--
	Ground maintenance equipment	sum	job		15,750
	Shop equipment	sum	job		12,000
	Miscellaneous equipment	sum	job		36,400
	Subtotal				\$ 64,150
	Contingencies				9,850
	TOTAL PERMANENT OPERATING EQUIPMENT				\$ 74,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 578,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 326,000
	TOTAL PROJECT COST (July 1963)				\$4,280,000

TABLE T-14
Cost estimate
Meramec River Basin, Missouri - Spring Creek Reservoir (I-28)

<u>Classi- fication No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 726,000
02	Relocations	805,000
03	Reservoirs	63,000
04	Dams	1,536,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	260,000
14	Recreation facilities	160,000
19	Buildings, grounds, and utilities	182,000
20	Permanent operating equipment	88,000
30	Engineering and design	632,000
31	Supervision and administration	<u>325,000</u>
Total project cost (July 1963)		\$4,780,000

TABLE T-14
Cost estimate
Meramec River Basin, Missouri - Spring Creek Reservoir (I-28)

<u>Classi- fication No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01	<u>LANDS AND DAMAGES</u>				(\$ 726,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 506,000
.2	<u>Bureau of Outdoor Recreation</u>				
	Total lands and damages, including contingencies	sum	job		<u>220,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 726,000
02.	<u>RELOCATIONS</u>				(\$ 805,000)
.1	<u>Roads</u>				
	S-1, State Highway U				
	Clearing and grubbing	3	acre	\$175.00	\$ 525
	Stripping	6,870	cu.yd.	0.45	3,092
	Seeding and fertilizing	2	acre	200.00	400
	Embankment, compacted	80,000	cu.yd.	0.75	60,000
	Base material, type I	2,060	ton	3.50	7,210
	Guardrail, steel w/wood posts	5,300	lin.ft.	3.25	17,225
	Surface aggregate, crushed stone	690	ton	4.50	3,105
	Concrete pipe culvert, class V, 72"	300	lin.ft.	47.00	14,100
	Riprap	51,300	ton	5.50	282,150
	Bedding material	27,600	ton	5.00	<u>138,000</u>
	Subtotal for State highways				\$ 525,807
	Contingencies				<u>79,193</u>
	Subtotal for State highways, exclusive of right-of-way				\$ 605,000
	Right-of-way cost				<u>0</u>
	Total cost for State highways				\$ 605,000

TABLE T-14 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	A-2, Access road 1500 ft. west of hwy junction				
	Clearing and grubbing	7	acre	175.00	\$ 1,225
	Stripping	11,500	cu.yd.	0.45	5,175
	Excavation, class A	1,780	cu.yd.	1.00	1,780
	Seeding and fertilizing	5	acre	200.00	1,000
	Machine grading, class I	30	sta.	110.00	3,300
	Fence, 4-strand w/wood posts	6,600	lin.ft.	1.75	11,550
	Base material, type I	2,570	ton	3.50	8,995
	Surface aggregate, crushed stone	860	ton	4.50	<u>3,870</u>
	Subtotal for township roads				\$ 36,895
	Contingencies				<u>5,605</u>
	Subtotal for township roads, exclusive of right-of-way				\$ 42,500
	Right-of-way costs for A-2				<u>4,500</u>
	Total cost for township roads				\$ 47,000
	Subtotal for roads				\$ 652,000
	Operation and maintenance during construction, including contingencies				<u>14,000</u>
	Total for roads				\$ 666,000
.3	<u>Cemeteries, Utilities and Structures</u>				
	<u>Cemeteries</u>				
	Cemeteries, grave relocations	sum	job		\$ <u>100,000</u>
	Subtotal for cemeteries				\$ 100,000
	Contingencies				<u>15,000</u>
	Total for cemeteries				\$ 115,000
	<u>Utilities</u>				
	Power line relocations	sum	job		\$ 13,200
	Telephone line relocations	sum	job		<u>7,500</u>
	Subtotal for utilities				\$ 20,700
	Contingencies				<u>3,300</u>
	Total for utilities				\$ 24,000

TABLE T-14 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
	Total for cemeteries, utilities and structures				\$ 139,000
	TOTAL FOR RELOCATIONS				\$ 805,000
03.	<u>RESERVOIRS</u>				(\$ 63,000)
	Clearing, untimbered	800	acre	25.00	\$ 20,000
	Clearing, timbered	200	acre	175.000	<u>35,000</u>
	Subtotal for reservoirs				\$ 55,000
	Contingencies				<u>8,000</u>
	TOTAL FOR RESERVOIRS				\$ 63,000
04.	<u>DAMS</u>				(\$1,536,000)
	Cofferdam, 1st stage				
	Embankment	31,300	cu.yd.	0.55	\$ 17,215
	Embankment removal	31,300	cu.yd.	0.25	7,825
	Unwatering	sum	job		20,000
	Care of water	sum	job		<u>15,000</u>
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		<u>15,000</u>
	Subtotal for cofferdams				\$ 101,040
	Spillway				
	Excavation, structural	250	cu.yd.	2.50	\$ 625
	Concrete, reinf., cutoff wall	300	cu.yd.	45.00	13,500
	Concrete, lightly reinf., slab	2,400	cu.yd.	42.00	100,800
	Steel, concrete reinf.	125,000	lb.	0.15	<u>18,750</u>
	Subtotal for spillway				\$ 133,675
	Outlet works				
	Excavation, common	6,700	cu.yd.	0.45	\$ 3,015
	Excavation, approach and discharge channels	14,000	cu.yd.	0.50	7,000
	Excavation, rock	340	cu.yd.	5.00	1,700
	Backfill	4,500	cu.yd.	1.25	<u>5,625</u>

TABLE T-14 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Riprap, approach and discharge channels	280	ton	5.50	\$ 1,540
	Bedding material, approach and dis- charge channels	130	ton	5.00	650
	Concrete, mass, approach walls	50	cu.yd.	35.00	1,750
	Concrete, reinf., stilling basin	120	cu.yd.	45.00	5,400
	Concrete, reinf., conduit	770	cu.yd.	45.00	34,650
	Concrete, reinf., riser	40	cu.yd.	50.00	2,000
	Sluice gate, 24"x24", 50' head, complete	1	ea.	800.00	800
	Steel, concrete reinf.	138,000	lb.	0.15	20,700
	Generator, 2500W power wrench	sum	job.		<u>2,100</u>
	Subtotal for outlet works				\$ 86,930
	Earth dam				
	Stripping, foundation	24,700	cu.yd.	0.45	\$ 11,115
	Excavation, core trench	4,200	cu.yd.	0.50	2,100
	Excavation, inspection trench	3,100	cu.yd.	0.50	1,550
	Excavation, grass spillway	1,040,000	cu.yd.	0.45	468,000
	Backfill, grass spill- way w/topsoil	28,100	cu.yd.	0.80	22,480
	Embankment, impervious from spillway	260,000	cu.yd.	0.45	117,000
	Embankment, random from spillway	79,600	cu.yd.	0.40	31,840
	Sand drain	52,000	ton	3.50	182,000
	Riprap	7,400	ton	5.50	40,700
	Bedding material	3,100	ton	5.00	15,500
	Mulching, fertilizing and seeding dam slope	3	acre	200.00	600
	Mulching, fertilizing and seeding spillway area	20	acre	200.00	4,000
	Road surfacing, A-3 w/10" stone base	3,840	sq.yd.	3.60	13,824
	Guardrail, steel w/wood posts	2,880	lin.ft.	3.25	9,360

TABLE T-14 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
	Total for cemeteries, utilities and structures				\$ 139,000
	TOTAL FOR RELOCATIONS				\$ 805,000
03.	<u>RESERVOIRS</u>				(\$ 63,000)
	Clearing, untimbered	800	acre	25.00	\$ 20,000
	Clearing, timbered	200	acre	175.000	<u>35,000</u>
	Subtotal for reservoirs				\$ 55,000
	Contingencies				<u>8,000</u>
	TOTAL FOR RESERVOIRS				\$ 63,000
04.	<u>DAMS</u>				(\$1,536,000)
	Cofferdam, 1st stage				
	Embankment	31,300	cu.yd.	0.55	\$ 17,215
	Embankment removal	31,300	cu.yd.	0.25	7,825
	Unwatering	sum	job		20,000
	Care of water	sum	job		<u>15,000</u>
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		<u>15,000</u>
	Subtotal for cofferdams				\$ 101,040
	Spillway				
	Excavation, structural	250	cu.yd.	2.50	\$ 625
	Concrete, reinf., cutoff wall	300	cu.yd.	45.00	13,500
	Concrete, lightly reinf., slab	2,400	cu.yd.	42.00	100,800
	Steel, concrete reinf.	125,000	lb.	0.15	<u>18,750</u>
	Subtotal for spillway				\$ 133,675
	Outlet works				
	Excavation, common	6,700	cu.yd.	0.45	\$ 3,015
	Excavation, approach and discharge channels	14,000	cu.yd.	0.50	7,000
	Excavation, rock	340	cu.yd.	5.00	1,700
	Backfill	4,500	cu.yd.	1.25	<u>5,625</u>

TABLE T-14 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Clearing, dam and grass spillway sites	70	acre	175.00	\$ 12,250
	Drilling 1-1/2" dia. grout holes	3,800	lin.ft.	4.50	17,100
	Grout	3,800	cu.ft.	5.00	19,000
	Piezometers	21	ea.	270.00	<u>5,670</u>
	Subtotal for earth dam				\$ 974,089
	Subtotal for main dam				\$1,295,734
	Contingencies				<u>194,266</u>
	Total for main dam				\$1,490,000
	Operation and maintenance during construction, including contingencies				<u>46,000</u>
	TOTAL FOR DAMS				\$1,536,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate, 30"x30", 50' head, complete	2	ea.	1,250.00	\$ 2,500
	Concrete, reinf., gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinf.	300	lb.	0.15	<u>45</u>
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				<u>355</u>
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 260,000)
	A-1, Access road to dam				
	Clearing and grubbing	20	acre	175.00	\$ 3,500
	Stripping	26,100	cu.yd.	0.45	11,745
	Excavation, class A	12,500	cu.yd.	1.00	12,500
	Excavation, rock	5,870	cu.yd.	3.25	19,078
	Seeding and fertilizing	10	acre	200.00	2,000
	Machine grading, class I	90	station	110.00	9,900
	Fence, removal	2,000	lin.ft.	0.50	1,000
	Fence, 4-strands w/wood posts	19,000	lin.ft.	1.75	33,250
	Base material, type I	7,390	ton	3.50	25,865
	Bituminous road mix (A-3)	21,100	sq.yd.	0.45	<u>9,495</u>
	Subtotal for A-1				\$ 128,333

TABLE T-14 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
	Local access roads, parking areas, grounds, and guardrails	sum	job		\$ 70,000
	Storage and maintenance, parking and work areas:				
	Crushed stone	2,300	tons	4.50	10,350
	A-2 bituminous surfacing w/crushed stone base	4,800	sq.yd.	1.65	<u>7,920</u>
	Subtotal				\$ 216,603
	Contingencies				<u>32,397</u>
	Subtotal for roads, exclusive of right-of-way				\$ 249,000
	Right-of-way costs				<u>8,000</u>
	Subtotal for roads, railroads, and bridges				\$ 257,000
	Operation and maintenance during construction, including contingencies				<u>3,000</u>
	TOTAL FOR ROADS, RAILROADS, AND BRIDGES				\$ 260,000
14.	<u>RECREATION FACILITIES</u>				(\$ 160,000)
	Picnic tables (PT-2)	20	ea.	55.00	\$ 1,100
	Picnic tables (PT-1 conc.)	20	ea.	75.00	1,500
	Concrete pads	30	ea.	150.00	4,500
	Barbecue braziers	40	ea.	65.00	2,600
	Refuse containers (SR-1)	25	ea.	45.00	1,125
	Incinerators (SI-2)	4	ea.	300.00	1,200
	Comfort stations (SC-2 mod.)	2	ea.	6,000.00	12,000
	Shelters (PS-1)	1	ea.	2,300.00	2,300
	Wells w/pressure tanks	1	ea.	10,000.00	10,000
	Water distribution lines	sum	job		4,800
	Fountains and hydrants	6	ea.	900.00	5,400
	Dry wells	6	ea.	500.00	3,000
	Launching ramps	sum	job		40,000
	Signs	sum	job		1,500
	Parking areas	0.75acre		15,000.00	11,250
	Access roads	1.20mile		15,000.00	18,000
	Paths	0.50mile		8,000.00	4,000
	Sand blanket	sum	job		5,625
	Trees	40	ea.	30.00	1,200
	Seeding, mulching and fertilizing	25	acre	160.00	4,000

TABLE T-14 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Tent campsites	sum	acre	160.00	\$ 4,000
	Subtotal				\$ 139,100
	Contingencies				<u>20,900</u>
	TOTAL FOR RECREATION FACILITIES				\$ 160,000
19.	<u>BUILDINGS, GROUNDS, AND UTILITIES</u>				(\$ 182,000)
	Equipment storage bldg. (100'x30')	sum	job		\$ 10,000
	Equipment maintenance bldg. (50'x30')	sum	job		9,000
	Administration bldg.	sum	job		75,000
	Overlook bldg.	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	<u>5,800</u>
	Subtotal				\$ 137,800
	Contingencies				<u>21,200</u>
	Subtotal buildings, grounds, and utilities				\$ 159,000
	Operation and maintenance during construction, including contingencies				<u>23,000</u>
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 182,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 88,000)
	Ground maintenance equipment	sum	job		\$ 23,750
	Shop equipment	sum	job		12,000
	Miscellaneous equipment	sum	job		<u>41,100</u>
	Subtotal				\$ 76,850
	Contingencies				<u>11,150</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 88,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 632,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 325,000
	TOTAL PROJECT COST (July 1963)				\$4,780,000

TABLE T-15
Cost estimate
Meramec River Basin, Missouri - Terre Bleue Creek Reservoir (I-30)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 285,000
02	Relocations	336,000
03	Reservoirs	23,000
04	Dams	1,628,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	110,000
14	Recreation facilities	100,000
19	Buildings, grounds, and utilities	182,000
20	Permanent operating equipment	82,000
30	Engineering and design	523,000
31	Supervision and administration	<u>268,000</u>
	Total project cost (July 1963)	\$ 3,540,000

TABLE T-15
Cost estimate
Meramec River Basin, Missouri - Terre Bleue Creek Reservoir (I-30)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.	<u>LANDS AND DAMAGES</u>				(\$ 285,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 223,000
.2	<u>Bureau of Outdoor Recreation</u>				
	Total lands and damages, including contingencies	sum	job		<u>62,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 285,000
02.	<u>RELOCATIONS</u>				(\$ 336,000)
.1	<u>Roads</u>				
	S-1, State Hwy JJ				
	Clearing and grubbing	2	acre	175.00	\$ 350
	Stripping	7,230	cu.yd.	0.45	3,254
	Seeding and fertilizing	1	acre	200.00	200
	Embankment, compacted	46,700	cu.yd.	0.75	35,025
	Fence, removal	2,400	lin.ft.	0.50	1,200
	Base material, type I	1,260	ton	3.50	4,410
	Guardrail, steel w/wood posts	2,200	lin.ft.	3.25	7,150
	Surface aggregate, crushed stone	340	ton	4.50	1,530
	Riprap	3,400	ton	5.50	18,700
	Bedding material	1,800	ton	5.00	9,000
	Bridge over Terre Bleue Creek	sum	job		<u>51,000</u>
	Subtotal for state highways				\$ 131,819
	Contingencies				<u>20,181</u>
	Subtotal for state highways, exclusive of right-of-way				\$ 152,000
	Right-of-way costs				<u>none</u>
	Total cost for state highways				\$ 152,000

TABLE T-15 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
A-2,	Access road at intersection of Highways D&W				
	Clearing and grubbing	5	acre	175.00	\$ 875
	Stripping	8,030	cu.yd.	0.45	3,614
	Seeding, fertilizing	4	acre	200.00	800
	Machine grading, class I	30	sta.	110.00	3,300
	Fence, 4-strand w/wood posts	6,200	lin.ft.	1.75	10,850
	Base material, type II	2,940	ton	4.00	11,760
	Surface aggregate, crushed stone	800	ton	4.50	<u>3,600</u>
	Subtotal for township roads				\$ 34,799
	Contingencies				<u>5,201</u>
	Subtotal for township roads, exclusive of right-of-way				\$ 40,000
	Right-of-way costs for A-2				<u>4,000</u>
	Total cost for township roads				\$ 44,000
	Subtotal for roads				\$ 196,000
	Operation and maintenance during construction, including contingencies				<u>12,000</u>
	TOTAL FOR ROADS				\$ 208,000
.3	<u>Cemeteries, Utilities, and Structures</u>				
	Cemeteries				
	Cemeteries, grave relocations	sum	job		\$ <u>100,000</u>
	Subtotal for cemeteries				\$ 100,000
	Contingencies				<u>15,000</u>
	Total for cemeteries				\$ 115,000

TABLE T-15 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Utilities				
	Power line relocations	sum	job		\$ 7,300
	Telephone line relocations	sum	job		<u>4,400</u>
	Subtotal for utilities				\$ 11,700
	Contingencies				<u>1,300</u>
	Total for utilities				\$ 13,000
	Total for cemeteries, utilities, and structures				\$ 128,000
	TOTAL FOR RELOCATIONS				\$ 336,000
03.	<u>RESERVOIRS</u>				(\$ 23,000)
	Clearing untimbered	100	acre	25.00	\$ 2,500
	Clearing timbered	100	acre	175.00	<u>17,500</u>
	Subtotal for reservoirs				\$ 20,000
	Contingencies				<u>3,000</u>
	TOTAL FOR RESERVOIRS				\$ 23,000
04.	<u>DAMS</u>				(\$1,628,000)
	Cofferdam, 1st stage				
	Embankment	54,400	cu.yd.	0.55	\$ 29,920
	Embankment removal	54,400	cu.yd.	0.25	13,600
	Unwatering	sum	job		30,000
	Care of water	sum	job		25,000
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		<u>15,000</u>
	Subtotal for cofferdams				\$ 139,520
	Spillway				
	Excavation, common	19,400	cu.yd.	0.45	\$ 8,730
	Excavation, core trench	1,600	cu.yd.	0.50	800
	Excavation rock	3,300	cu.yd.	5.00	16,500
	Backfill, structures	2,600	cu.yd.	1.50	3,900
	Backfill, core trench				
	impervious material	1,600	cu.yd.	1.40	2,240
	Crushed stone, under still- ing basin and chute floor	5,770	ton	4.50	25,965

TABLE T-15 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Riprap in exit channel	2,120	ton	5.50	\$ 11,660
	Bedding material in exit channel	1,390	ton	5.00	6,950
	Concrete, reinf., over- flow sec.	160	cu.yd.	45.00	7,200
	Concrete, reinf., abut- ment walls	260	cu.yd.	45.00	11,700
	Concrete, reinf., approach walls	360	cu.yd.	45.00	16,200
	Concrete, reinf., chute walls	2,750	cu.yd.	45.00	123,750
	Concrete, reinf., train- ing walls	1,020	cu.yd.	45.00	45,900
	Concrete, reinf., wing walls	650	cu.yd.	45.00	29,250
	Concrete, lightly reinf. chute floor	1,170	cu.yd.	42.00	49,140
	Concrete, lightly reinf., stilling basin floor	530	cu.yd.	40.00	21,200
	Steel, concrete reinf.	950,000	lb.	0.15	142,500
	Drilling 1-1/2" diameter grout holes	500	lin.ft.	4.50	2,250
	Grout	500	cu.ft.	5.00	<u>2,500</u>
	Subtotal for spillway				\$ 528,335
	Outlet works				
	Excavation, common	5,300	cu.yd.	0.45	\$ 2,385
	Excavation, approach and discharge channels	13,400	cu.yd.	0.50	6,700
	Excavation, rock	240	cu.yd.	5.00	1,200
	Backfill	3,800	cu.yd.	1.25	4,750
	Riprap, approach and discharge channels	270	ton	5.50	1,485
	Bedding material, approach and discharge channels	120	ton	5.00	600
	Concrete, mass, approach walls	50	cu.yd.	35.00	1,750
	Concrete, reinf., stilling basin	100	cu.yd.	45.00	4,500
	Concrete, reinf., conduit	510	cu.yd.	45.00	22,950
	Concrete, reinf., riser	20	cu.yd.	50.00	1,000
	Sluice gate, 16"x16", 30' head complete	1	ea.	1,100.00	1,100
	Steel, concrete, reinf.	94,000	lb.	0.15	14,100
	Generator, 2500W and power wrench	sum	job		<u>2,100</u>
	Subtotal for outlet works				\$ 64,620

TABLE T-15 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
	Earth dam				
	Stripping, foundation	25,900	cu.yd.	0.45	\$ 11,655
	Excavation, core trench	8,200	cu.yd.	0.50	4,100
	Excavation, inspection trench	2,900	cu.yd.	0.50	1,450
	Embankment, impervious fill	65,000	cu.yd.	0.75	48,750
	Embankment, pervious fill	150,000	cu.yd.	0.65	97,500
	Embankment, random fill	140,000	cu.yd.	0.70	98,000
	Sand drain	73,100	ton	3.00	219,300
	Riprap	11,900	ton	5.50	65,450
	Bedding material	4,900	ton	5.00	24,500
	Mulching, fertilizing and seeding dam slope	4	acre	200.00	800
	Road surfacing, A-3 w/10" stone base	4,640	sq.yd.	3.60	16,704
	Guardrail, steel w/wood posts	3,480	lin.ft.	3.25	11,310
	Clearing, damsite	20	acre	175.00	3,500
	Drilling 1-1/2" dia. grout holes	5,000	lin.ft.	4.50	22,500
	Grout	5,000	cu.ft.	5.00	25,000
	Piezometer	30	ea.	270.00	8,100
	Subtotal for earth dam				\$ 658,619
	Subtotal for main dam				\$1,391,094
	Contingencies				<u>190,906</u>
	Total for main dam				\$1,582,000
	Operation and maintenance during construction, including contingencies				<u>46,000</u>
	TOTAL FOR DAMS				\$1,628,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate, 30"x30", 50' head, complete	2	ea.	1,250.00	\$ 2,500
	Concrete, reinf., gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinf.	300	lb.	0.15	<u>45</u>
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				<u>355</u>
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000

TABLE T-15 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
08.	<u>ROADS, RAILROADS, AND BRIDGES</u>				(\$ 110,000)
	A-1, Access road to dam				
	Clearing and grubbing	1	cu.yd.	175.00	\$ 175
	Stripping	1,630	cu.yd.	0.45	734
	Seeding and fertilizing	1	acre	200.00	200
	Machine grading, class I	5	station	110.00	550
	Fence, 4-strand w/wood posts	1,000	lin.ft.	1.75	1,750
	Base material, type II	460	ton	4.00	1,840
	Bituminous, road mix (A-3)	1,000	sq.yd.	0.45	<u>450</u>
	Subtotal for A-1				\$ 5,699
	Local access roads, parking areas, grounds, and guard-rail	sum	job		\$ 70,000
	Storage and maintenance, parking and work areas:				
	Crushed stone	2,300	ton	4.50	10,350
	A-2 bituminous surfacing w/crushed stone base	4,800	sq.yd.	1.65	<u>7,920</u>
	Subtotal				\$ 93,969
	Contingencies				<u>14,031</u>
	Subtotal for roads, exclusive of right-of-way				\$ 108,000
	Right-of-way costs				<u>none</u>
	Subtotal for roads, railroads, and bridges				\$ 108,000
	Operation and maintenance during construction, including contingencies				<u>2,000</u>
	TOTAL FOR ROADS, RAILROADS, AND BRIDGES				\$ 110,000

TABLE T-15 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
14.	<u>RECREATION FACILITIES</u>				(\$ 100,000)
	Picnic tables (PT-2)	20	ea.	55.00	\$ 1,100
	Picnic tables (PT-1 conc.)	20	ea.	75.00	1,500
	Concrete pads	20	ea.	150.00	3,000
	Barbecue braziers	40	ea.	65.00	2,600
	Refuse containers (SR-1)	14	ea.	45.00	630
	Incinerators (SI-2)	2	ea.	300.00	600
	Comfort stations (SC-2 mod)	2	ea.	6,000.00	12,000
	Launching ramps	sum	job		30,000
	Signs	sum	job		770
	Parking areas	0.67 acre		15,000.00	10,000
	Access roads	1.20 mile		15,000.00	18,000
	Tent campsites	sum	job		2,000
	Wells w/pitcher pumps	sum	job		<u>4,800</u>
	Subtotal				\$ 87,000
	Contingencies				<u>13,000</u>
	TOTAL FOR RECREATION FACILITIES				\$ 100,000
19.	<u>BUILDINGS, GROUNDS, AND UTILITIES</u>				(\$ 182,000)
	Equipment storage bldg. (100'x30')	sum	job		\$ 10,000
	Equipment maintenance bldg. (50'x30')	sum	job		9,000
	Administration bldg.	sum	job		75,000
	Overlook bldg.	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	<u>5,800</u>
	Subtotal				\$ 137,800
	Contingencies				<u>21,200</u>
	Subtotal for buildings, grounds, and utilities				\$ 159,000
	Operation and maintenance during construction, including contingencies				<u>23,000</u>
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 182,000

TABLE T-15 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 82,000)
	Ground maintenance equipment	sum	job		\$ 20,250
	Shop equipment	sum	job		12,350
	Miscellaneous equipment	sum	job		<u>38,600</u>
	Subtotal				\$ 71,200
	Contingencies				<u>10,800</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 82,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 523,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 268,000
	TOTAL PROJECT COST (July 1963)				\$3,540,000

TABLE T-16
Cost estimate
Meramec River Basin, Missouri - Redoak Creek Reservoir (I-32)

<u>Classification No.</u>	<u>Item</u>	<u>Cost</u>
01 -	Lands and damages	\$ 814,000
02	Relocations	346,000
03	Reservoirs	60,000
04	Dams	1,794,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads and bridges	155,000
14	Recreation facilities	100,000
19	Buildings, grounds and utilities	182,000
20	Permanent operating equipment	81,000
30	Engineering and design	579,000
31	Supervision and administration	<u>296,000</u>
Total project cost (July 1963)		\$4,410,000

TABLE T-16
Cost estimate
Meramec River Basin, Missouri - Redoak Creek Reservoir (I-32)

Classi- fication No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.	<u>LANDS AND DAMAGES</u>				(\$ 814,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 729,000
.2	<u>Bureau of Outdoor Recreation</u>				
	Total lands and damages, including contingencies	sum	job		<u>85,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 814,000
02.	<u>RELOCATIONS</u>				(\$ 346,000)
.1	<u>Roads</u>				
	S-1, State Hwy T at Redoak Creek				
	Stripping	5,570	cu.yd.	0.45	\$ 2,507
	Seeding and fertilizing	2	acre	200.00	400
	Embankment, compacted	48,800	cu.yd.	0.75	36,600
	Fence, removal	3,000	lin.ft.	0.50	1,500
	Base material, type I	1,290	ton	4.00	5,160
	Guardrail, steel w/wood posts	2,180	lin.ft.	3.25	7,085
	Bituminous road mix (A-3)	3,700	sq. yd.	0.45	1,665
	Riprap	3,540	ton	6.00	21,240
	Bedding material	1,900	ton	5.00	9,500
	Bridge over Redoak Creek	sum	job		<u>53,000</u>
	Subtotal				\$ 138,657
	S-2, State Hwy H East of dam				
	Clearing and grubbing	4	acre	175.00	\$ 700
	Stripping and grubbing	6,230	cu.yd.	0.45	2,804
	Seeding and fertilizing	4	acre	200.00	800
	Machine grading, class I	20	station	110.00	2,200
	Machine grading, class II	5	station	150.00	750
	Fence, 4-strand w/wood posts	4,800	lin.ft.	1.75	8,400
	Base material, type I	1,890	ton	4.00	7,560
	Bituminous, road mix (A-3)	5,350	sq.yd.	0.45	<u>2,408</u>
	Subtotal				\$ 25,622
	Subtotal for State highways				\$ 164,279
	Contingencies				<u>24,721</u>
	Subtotal for State highways, exclusive of right-of-way				\$ 189,000

TABLE T-16

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Right-of-way costs				<u>None</u>
	Total cost for State highways				\$189,000
	Subtotal for roads				\$189,000
	Operation and maintenance during construction, including contingencies				<u>15,000</u>
	Total for roads				\$204,000
.3	<u>Cemeteries, Utilities and Structures</u>				
	<u>Cemeteries</u>				
	Cemeteries, grave relocations	sum	job		<u>\$100,000</u>
	Subtotal for cemeteries				\$100,000
	Contingencies				<u>15,000</u>
	Total for cemeteries				\$115,000
	<u>Utilities</u>				
	Power line relocations	sum	job		\$ 15,400
	Telephone line relocations	sum	job		<u>8,100</u>
	Subtotal for utilities				\$ 23,500
	Contingencies				<u>3,500</u>
	Total for utilities				\$ 27,000
	Total for cemeteries, utilities and structures				\$142,000
	TOTAL FOR RELOCATIONS				\$346,000

TABLE T-16 (Cont'd)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
03.	<u>RESERVOIRS</u>				(\$ 60,000)
	Bridge removal	sum	job		\$ 5,000
	Clearing, untimbered	500	acre	25.00	12,500
	Clearing, timbered	200	acre	175.00	35,000
	Subtotal for reservoirs				\$ 52,500
	Contingencies				7,500
	TOTAL FOR RESERVOIRS				\$ 60,000
04.	<u>DAMS</u>				(\$1,794,000)
	Cofferdam, 1st stage				
	Embankment	21,000	cu.yd.	0.55	\$ 11,550
	Embankment removal	21,000	cu.yd.	0.25	5,250
	Unwatering	sum	job		30,000
	Care of water	sum	job		25,000
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		15,000
	Subtotal for cofferdams				\$ 112,800
	Spillway				
	Excavation, structural	400	cu.yd.	2.50	\$ 1,000
	Concrete, reinf., cutoff wall	500	cu.yd.	45.00	22,500
	Concrete, lightly reinf., slab	4,200	cu.yd.	42.00	176,400
	Steel, concrete reinforcing	217,000	lb.	0.15	32,550
	Subtotal for spillway				\$ 232,450
	Outlet works				
	Excavation, common	6,300	cu.yd.	0.45	\$ 2,835
	Excavation, approach and discharge channels	14,000	cu.yd.	0.50	7,000
	Excavation, rock	320	cu.yd.	5.00	1,600
	Backfill	4,000	cu.yd.	1.25	5,000
	Riprap, approach and discharge channels	280	ton	6.00	1,680
	Bedding material, approach and discharge channels	130	ton	5.00	650
	Concrete, mass, approach walls	50	cu.yd.	35.00	1,750

TABLE T-16 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Concrete, reinf., stilling basin	120	cu.yd.	45.00 \$	5,400
	Concrete, reinf., conduit	770	cu.yd.	45.00	34,650
	Concrete, reinf., riser	30	cu.yd.	50.00	1,500
	Sluice gate, 30" x 30", 50' head, complete	1	each	1200.00	1,200
	Steel, concrete, reinforcing	137,000	lb.	0.15	20,550
	Generator, 2500W and power wrench	sum	job		<u>2,100</u>
	Subtotal for outlet works			\$	85,915
	Earth dam				
	Stripping, foundation	55,800	cu.yd.	0.45 \$	25,110
	Excavation, core trench	1,400	cu.yd.	0.50	700
	Excavation, inspection trench	5,700	cu.yd.	0.50	2,850
	Excavation, grass spillway	312,000	cu.yd.	0.45	140,400
	Backfill, grass spillway w/topsoil	13,200	cu.yd.	0.80	10,560
	Embankment, impervious from spillway	453,000	cu.yd.	0.45	203,850
	Embankment, random from spillway	201,000	cu.yd.	0.40	80,400
	Sand drain	112,000	ton	3.50	392,000
	Riprap	15,100	ton	6.00	90,600
	Bedding material	6,300	ton	5.00	31,500
	Mulching, fertilizing, and seeding dam slope	7	acre	200.00	1,400
	Mulching, fertilizing, and seeding grass spillway	20	acre	200.00	4,000
	Road surfacing, A-3, w/10" stone base	5,970	sq.yd.	3.60	21,492
	Guardrail, steel w/wood posts	4,480	lin.ft.	3.25	14,560
	Clearing, dam and grass spillway sites	50	acre	175.00	8,750
	Drilling 1-1/2" dia. grout holes	5,400	lin.ft.	4.50	24,300
	Grout	5,400	cu.ft.	5.00	27,000
	Piezometers	33	each	270.00	<u>8,910</u>
	Subtotal for earth dam				\$1,088,382
	Subtotal for main dam				\$1,519,547
	Contingencies				<u>228,453</u>
	Total for main dam				\$1,748,000
	Operation and maintenance during construction, including contingencies				46,000
	TOTAL FOR DAMS				\$1,794,000
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TABLE T-16 (Cont'd)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate, 30"x30", 50' head, complete	2	each	1,250.00	\$ 2,500
	Concrete, reinf., gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinf.	300	lb.	0.15	45
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				355
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000
08.	<u>ROADS, RAILROADS, AND BRIDGES</u>				(\$ 155,000)
	A-1, access road to dam				
	Clearing and grubbing	7	acre	175.00	\$ 1,225
	Stripping	8,900	cu.yd.	0.45	4,005
	Seeding and fertilizing	8	acre	200.00	1,600
	Machine grading, class I	40	station	110.00	4,400
	Fence removal	450	lin.ft.	0.50	225
	Fence, 4-strand w/wood posts	8,000	lin.ft.	1.75	14,000
	Base material, type I	1,900	ton	4.00	7,600
	Surface aggregate, crushed stone	1,900	ton	4.50	8,550
	Subtotal for A-1				\$ 41,605
	Local access roads, parking areas, grounds and guardrail	sum	job		\$ 70,000
	Storage and maintenance, parking and work areas:				
	Crushed stone	2,300	ton	4.50	10,350
	A-2 bituminous surfacing w/crushed stone base	4,800	sq.yd.	1.65	7,920
	Subtotal				\$ 129,875
	Contingencies				19,125
	Subtotal for roads, excl. of right-of-way				\$ 149,000
	Right-of-way cost				4,000
	Subtotal for roads, railroads, and bridges				\$ 153,000
	Operation and maintenance during construction, including contingencies				2,000
	TOTAL FOR ROADS, RAILROADS, AND BRIDGES				\$ 155,000

TABLE T-16 (Cont'd)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
14.	<u>RECREATION FACILITIES</u>				(\$ 100,000)
	Picnic tables (PT-2)	20	each	55.00	1,100
	Picnic tables (PT-1 conc.)	20	each	75.00	1,500
	Concrete pads	20	each	150.00	3,000
	Barbecue braziers	40	each	65.00	2,600
	Refuse containers (SR-1)	14	each	45.00	630
	Incinerators (SI-2)	2	each	300.00	600
	Comfort stations (SC-2, mod.)	2	each	6000.00	12,000
	Launching ramps	sum	job		30,000
	Signs	sum	job		770
	Parking areas	0.67	acre	15000.00	10,000
	Access roads	1.20	mile	15000.00	18,000
	Tent campsites	sum	job		2,000
	Wells w/pltcher pumps	sum	job		4,800
	Subtotal				\$ 87,000
	Contingencies				13,000
	TOTAL FOR RECREATION FACILITIES				\$ 100,000
19.	<u>BUILDINGS, GROUNDS AND UTILITIES</u>				(\$ 182,000)
	Equipment storage bldg. (100' x 30')	sum	job		\$ 10,000
	Equipment maintenance bldg. (50' x 30')	sum	job		9,000
	Administration building	sum	job		75,000
	Overlook building	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	5,800
	Subtotal				\$ 137,800
	Contingencies				21,200
	Subtotal buildings, grounds and utilities				\$ 159,000
	Operation and maintenance during construction including contingencies				23,000
	TOTAL FOR BUILDINGS, GROUNDS AND UTILITIES				\$ 182,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 81,000)
	Ground maintenance equipment	sum	job		\$ 19,750
	Shop equipment	sum	job		12,000
	Miscellaneous equipment	sum	job		38,600
	Subtotal				\$ 70,350
	Contingencies				10,650
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 81,000

TABLE T-16 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
30.	<u>ENGINEERING AND DESIGN</u>				\$ 579,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 296,000
	TOTAL PROJECT COST (July 1963)				\$4,410,000

TABLE T-17
Cost estimate
Meramec River Basin, Missouri - Little Bourbeuse River Reservoir (I-33A)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 400,000
02	Relocations	281,000
03	Reservoirs	40,000
04	Dams	2,742,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	379,000
14	Recreation facilities	50,000
19	Buildings, grounds, and utilities	182,000
20	Permanent operating equipment	81,000
30	Engineering and design	621,000
31	Supervision and administration	<u>371,000</u>
	Total project cost (July 1963)	\$5,150,000

TABLE T-17
Cost estimate
Meramec River Basin, Missouri - Little Bourbeuse River Reservoir (I-33A)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.	<u>LANDS AND DAMAGES</u>				(\$400,000)
.1	<u>Corps of Engineers</u>				
-	Total lands and damages, including contingencies	sum	job		\$310,000
.2	<u>Bureau of Outdoor Recreation</u>				
-	Total lands and damages, including contingencies	sum	job		<u>90,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$400,000
02.	<u>RELOCATIONS</u>				(\$281,000)
.1	<u>Roads</u>				
	C-1, East & West Road at Three Mile Creek				
	Clearing and grubbing	2	acre	175.00	\$ 350
	Stripping	3,400	cu.yd.	0.45	1,530
	Seeding and fertilizing	1	acre	200.00	200
	Embankment, compacted	36,400	cu.yd.	0.75	27,300
	Fence, removal	2,400	lin.ft.	0.50	1,200
	Base material, type II	1,540	ton	4.00	6,160
	Guardrail, steel w/wood posts	1,800	lin.ft.	3.25	5,850
	Surface aggregate, crushed stone	320	ton	4.00	1,280
	Riprap	2,000	ton	5.50	11,000
	Bedding material	1,100	ton	5.00	5,500
	Bridge over Three Mile Creek	sum	job		<u>24,000</u>
	Subtotal				\$ 84,370
	C-2 North & South Road at Little Bourbeuse River				
	Clearing and grubbing	1	acre	175.00	\$ 175
	Seeding and fertilizing	1	acre	200.00	200
	Embankment, compacted	1,600	cu.yd.	0.75	1,200
	Fence, removal	800	lin.ft.	0.50	400
	Base material, type II	420	ton	4.00	1,680
	Surface aggregate, crushed stone	100	ton	4.50	450
	Bridge over Little Bourbeuse River	sum	job		<u>24,000</u>
	Subtotal				\$ 28,105
	Subtotal for County roads				\$112,475
	Contingencies				<u>17,525</u>
	Subtotal for County roads, exclusive of right-of-way				\$130,000

TABLE T-17 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Right-of-way costs				<u>None</u>
	Total cost for County roads				\$130,000
	Subtotal for roads				\$130,000
	Operati including contingencies				<u>4,000</u>
	Total for roads				\$134,000
.3	<u>Cemeteries, Utilities and Structures</u>				
	Cemeteries				
	Cemeteries, grave relocations	sum	job		<u>\$100,000</u>
	Subtotal for cemeteries				\$100,000
	Contingencies				<u>15,000</u>
	Total for cemeteries				\$115,000
	Utilities				
	Power line relocations	sum	job		\$ 18,600
	Telephone line relocations	sum	job		<u>9,400</u>
	Subtotal for utilities				\$ 28,000
	Contingencies				<u>4,000</u>
	Total for utilities				\$ 32,000
	Total for cemeteries, utilities and structures				\$147,000
	TOTAL FOR RELOCATIONS				\$281,000

TABLE T-17 (Cont'd)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
03.	<u>RESERVOIRS</u>				(\$ 40,000)
	Bridge removal	sum	job		\$ 5,000
	Clearing, untimbered	500	acre	25.00	12,500
	Clearing, timbered	100	acre	175.00	17,500
	Subtotal for reservoirs				\$ 35,000
	Contingencies				5,000
	TOTAL FOR RESERVOIRS				\$ 40,000
04.	<u>DAMS</u>				(\$2,742,000)
	Cofferdam, 1st stage				
	Embankment	76,000	cu.yd.	0.55	\$ 41,800
	Embankment removal	76,000	cu.yd.	0.25	19,000
	Unwatering	sum	job		40,000
	Care of water	sum	job		35,000
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		15,000
	Subtotal for cofferdams				\$ 176,800
	Spillway				
	Excavation, common	30,000	cu.yd.	0.45	\$ 13,500
	Excavation, core trench	1,600	cu.yd.	0.50	800
	Excavation, rock	2,200	cu.yd.	5.00	11,000
	Backfill, structures	2,500	cu.yd.	1.50	3,750
	Backfill, core trench, impervious material	1,600	cu.yd.	1.40	2,240
	Crushed stone, under stilling basin and chute floor	5,490	ton	4.50	24,705
	Riprap in exit channel	2,120	ton	5.50	11,660
	Bedding material in exit channel	1,390	ton	5.00	6,950
	Concrete, reinf., overflow section	160	cu.yd.	45.00	7,200
	Concrete, reinf., abutment walls	250	cu.yd.	45.00	11,250
	Concrete, reinf., approach walls	390	cu.yd.	45.00	17,550

TABLE T-17 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Concrete, reinf., chute walls	2,510	cu.yd.	45.00	\$112,950
	Concrete, reinf., training walls	1,380	cu.yd.	45.00	62,100
	Concrete, reinf., wing walls	340	cu.yd.	45.00	15,300
	Concrete, lightly reinf., chute floor	1,490	cu.yd.	42.00	62,580
	Concrete, lightly reinf., stilling basin floor	390	cu.yd.	40.00	15,600
	Steel, concrete reinforcing	941,000	lb.	0.15	141,150
	Drilling 1-1/2" dia. grout holes	500	lin.ft.	4.50	2,250
	Grout	500	cu.ft.	5.00	2,500
	Subtotal for spillway				\$525,035
	Outlet works				
	Excavation, common	8,200	cu.yd.	0.45	\$ 3,690
	Excavation, approach and discharge channels	14,000	cu.yd.	0.50	7,000
	Excavation, rock	400	cu.yd.	5.00	2,000
	Backfill	5,600	cu.yd.	1.25	7,000
	Riprap, approach and discharge channels	280	ton	5.50	1,540
	Bedding material, approach and discharge channels	130	ton	5.00	650
	Concrete, mass, approach walls	50	cu.yd.	35.00	1,750
	Concrete, reinf., stilling basin	120	cu.yd.	45.00	5,400
	Concrete, reinf., conduit	1,040	cu.yd.	45.00	46,800
	Concrete, reinf., riser	50	cu.yd.	50.00	2,500
	Sluice gate, 24" x 24", 50' head, complete	1	each	800.00	800
	Steel, concrete reinforcing	180,000	lb.	0.15	27,000
	Generator, 2500W and power wrench	sum	job		2,100
	Subtotal for outlet works				\$108,230

TABLE T-17 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Earth dam				
	Stripping, foundation	59,700	cu.yd.	0.45	\$ 26,865
	Excavation, core trench	9,600	cu.yd.	0.50	4,800
	Excavation, inspection trench	4,800	cu.yd.	0.50	2,400
	Embankment, impervious fill	736,000	cu.yd.	0.75	552,000
	Embankment, random fill	266,000	cu.yd.	0.70	186,200
	Sand drain	114,000	ton	4.00	456,000
	Riprap	19,400	ton	5.50	106,700
	Bedding material	8,100	ton	5.00	40,500
	Mulching, fertilizing and seeding dam slope	20	acre	200.00	4,000
	Road surfacing, A-3, w/10" stone base	6,640	sq.yd.	3.60	23,904
	Guardrail, steel w/wood posts	4,980	lin.ft.	3.25	16,185
	Clearing, damsite	40	acre	175.00	7,000
	Drilling 1-1/2" dia. grout holes	9,400	lin.ft.	4.50	42,300
	Grout	9,400	cu.ft.	5.00	47,000
	Piezometers	36	each	270.00	9,720
	Subtotal for earth dam				\$1,525,574
	Subtotal for main dam				\$2,335,639
	Contingencies				338,361
	Total for main dam				\$2,674,000
	Operation and maintenance during construction, including contingencies				68,000
	TOTAL FOR DAMS				\$2,742,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate, 30" x 30", 50' head, complete	2	each	1250.00	\$ 2,500
	Concrete, reinf., gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinf.	300	lb.	0.15	45
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				355
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000

TABLE T-17 (Cont'd)

<u>Classification</u> <u>No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit</u> <u>price</u>	<u>Total esti-</u> <u>mated cost</u>
08.	ROADS, RAILROADS AND BRIDGES				(\$379,000)
	A-1, East and West Road to Damsite				
	Clearing and grubbing	10	acre	175.00	\$ 1,750
	Stripping	20,300	cu.yd.	0.45	9,135
	Excavation, class A	62,500	cu.yd.	1.00	62,500
	Excavation, rock	13,400	cu.yd.	7.50	100,500
	Seeding and fertilizing	8	acre	200.00	1,600
	Machine grading, class I	50	station	110.00	5,500
	Fence, 4-strand w/wood posts	11,800	lin.ft.	1.75	20,650
	Base material, type II	5,600	ton	4.00	22,400
	Bituminous, road mix (A-3)	14,400	sq.yd.	0.45	6,480
	Subtotal for A-1				\$230,515
	Local access roads, parking areas, ground and guardrail	sum	job		\$ 70,000
	Storage and maintenance, parking and work areas:				
	Crushed stone	2,300	ton	4.50	10,350
	A-2 bituminous surfacing w/crushed stone base	4,800	sq.yd.	1.65	7,920
	Subtotal				\$318,785
	Contingencies				47,715
	Subtotal for roads, exclusive of right-of-way				\$366,500
	Right-of-way cost				4,500
	Subtotal for roads, railroads and bridges				\$371,000
	Operation and maintenance during construction, including contingencies				8,000
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$379,000

TABLE T-17 (Cont'd)

<u>Classification</u> <u>No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
14.	<u>RECREATION FACILITIES</u>				(\$ 50,000)
	Picnic tables (PT-2)	10	each	55.00	\$ 550
	Picnic tables (PT-1 conc.)	10	each	75.00	750
	Concrete pads	10	each	150.00	1,500
	Barbecue braziers	20	each	65.00	1,300
	Refuse containers (SR-1)	7	each	45.00	315
	Incinerators (SI-2)	1	each	300.00	300
	Comfort stations (SC-2 mod.)	1	each	6,000.00	6,000
	Launching ramps	sum	job		15,000
	Signs	sum	job		385
	Parking areas	0.33	acre	15,000.00	5,000
	Access roads	0.60	mile	15,000.00	9,000
	Tent campsites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		2,400
	Subtotal				\$ 43,500
	Contingencies				6,500
	TOTAL FOR RECREATION FACILITIES				\$ 50,000
19.	<u>BUILDINGS, GROUNDS, AND UTILITIES</u>				(\$ 182,000)
	Equipment storage building (100'x30')	sum	job		\$ 10,000
	Equipment maintenance building (50'x30')	sum	job		9,000
	Administration building	sum	job		75,000
	Overlook building	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	5,800
	Subtotal				\$ 137,800
	Contingencies				21,200
	Subtotal for buildings, grounds, and utilities				\$ 159,000
	Operation and maintenance during construction, including contingencies				23,000
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 182,000

TABLE T-17 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 81,000)
	Ground maintenance equipment	sum	job	\$	19,750
	Shop equipment	sum	job		12,000
	Miscellaneous equipment	sum	job		<u>38,250</u>
	Subtotal			\$	70,000
	Contingencies				<u>11,000</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT			\$	81,000
30.	<u>ENGINEERING AND DESIGN</u>			\$	621,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>			\$	371,000
	TOTAL PROJECT COST (JULY 1963)			\$	5,150,000

TABLE T-18
Cost estimate
Meramec River Basin, Missouri - Brush Creek Reservoir (I-35A)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 466,000
02	Relocations	580,000
03	Reservoirs	60,000
04	Dams	2,593,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	168,000
14	Recreation facilities	50,000
19	Buildings, grounds, and utilities	182,000
20	Permanent operating equipment	81,000
30	Engineering and design	651,000
31	Supervision and administration	<u>366,000</u>
	Total project cost (July 1963)	\$5,200,000

TABLE T-18
Cost estimate
Meramec River Basin, Missouri - Brush Creek Reservoir (I-35A)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.	<u>LANDS AND DAMAGES</u>				(\$466,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages including contingencies	sum	job		\$358,000
.2	<u>Bureau of Outdoor Recreation</u>				
	Total lands and damages, including contingencies	sum	job		<u>108,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$466,000
02.	<u>RELOCATIONS</u>				(\$580,000)
.1	<u>Roads</u>				
	S-1, Hwy 19				
	Clearing and grubbing	10	acre	175.00	\$ 1,750
	Stripping	6,450	cu.yd.	0.45	2,903
	Seeding and fertilizing	1	acre	200.00	200
	Embankment, compacted	27,300	cu.yd.	0.75	20,475
	Fence, removal	2,800	lin.ft.	0.50	1,400
	Fence, 4-strand w/wood posts	2,300	lin.ft.	1.75	4,025
	Base material, type I	980	ton	3.50	3,430
	Guardrail, steel w/wood posts	2,000	lin.ft.	3.25	6,500
	Bituminous asphaltic concrete	2,800	sq.yd.	2.50	7,000
	Riprap	2,800	ton	5.50	15,400
	Bedding material	1,500	ton	4.50	6,750
	Bridge removal	sum	job		8,000
	Bridge over Brush Creek	sum	job		<u>57,000</u>
	Subtotal				\$134,833
	S-2, Hwy C at Souder Creek				
	Clearing and grubbing	3	acre	175.00	\$ 525
	Stripping	1,820	cu.yd.	0.45	819
	Embankment, compacted	21,800	cu.yd.	0.75	16,350
	Seeding and fertilizing	1	acre	200.00	200
	Base material, type I	770	ton	3.50	2,695
	Guardrail, steel w/wood posts	1,600	lin.ft.	3.25	5,200
	Bituminous asphaltic concrete	1,800	sq.yd.	2.50	4,500
	Fence, removal	2,400	lin.ft.	0.50	1,200
	Fence, 4-strand w/wood posts	2,000	lin.ft.	1.75	3,500
	Riprap	640	ton	5.50	3,520
	Bedding material	350	ton	4.50	1,575
	Bridge on Hwy C	sum	job		<u>53,000</u>
	Subtotal				\$ 93,084

TABLE T-18 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Subtotal for State highways				\$227,917
	Contingencies				<u>34,083</u>
	Subtotal for State highways, exclusive of right-of-way				\$262,000
	Right-of-way costs				<u>None</u>
	Total cost for State highways				\$262,000
C-1, East & West Road west of Oak Hill					
	Clearing and grubbing	4	acre	175.00	\$ 700
	Stripping	5,930	cu.yd.	0.45	2,669
	Seeding and fertilizing	2	acre	200.00	400
	Embankment, compacted	1,700	cu.yd.	0.75	1,275
	Machine grading, class I	20	station	110.00	2,200
	Fence, 4-strand w/wood posts	4,000	lin.ft.	1.75	7,000
	Base material, type II	1,540	ton	4.00	6,160
	Surface aggregate, crushed stone	520	ton	4.00	<u>2,080</u>
	Subtotal				\$ 22,484
C-2, North & South Road east of Oak Hill					
	Clearing and grubbing	3	acre	175.00	\$ 525
	Stripping	4,930	cu.yd.	0.45	2,219
	Seeding and fertilizing	2	acre	200.00	400
	Machine grading, class I	20	station	110.00	2,200
	Fence, 4-strand w/wood posts	3,800	lin.ft.	1.75	6,650
	Base material, type II	1,470	ton	4.00	5,880
	Surface aggregate, crushed stone	500	ton	4.00	<u>2,000</u>
	Subtotal				\$ 19,874
C-3, North & South Road east of Hwy F					
	Clearing and grubbing	10	acre	175.00	\$ 1,750
	Stripping	15,700	cu.yd.	0.45	7,065
	Excavation, class A	13,300	cu.yd.	1.00	13,300
	Excavation, rock	330	cu.yd.	3.25	1,073
	Seeding and fertilizing	5	acre	200.00	1,000
	Embankment, compacted	13,600	cu.yd.	0.75	10,200
	Machine grading, class I	20	station	110.00	2,200

TABLE T-18 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Machine grading, class II	7	station	150.00	\$ 1,050
	Fence, 4-strand w/wood posts	8,900	lin.ft.	1.75	15,575
	Base material, type II	2,800	ton	4.00	11,200
	Guardrail, steel w/wood posts	800	lin.ft.	3.25	2,600
	Surface aggregate, crushed stone	1,150	ton	4.00	<u>4,600</u>
	Subtotal				\$ 71,613
	Subtotal for County roads				\$113,971
	Contingencies				<u>17,029</u>
	Subtotal for County roads, exclusive of right-of-way				\$131,000
	Right-of-way costs				
	County road, C-1				\$ 8,000
	County road, C-2				<u>6,000</u>
	Subtotal for right-of-way costs				\$ 14,000
	Total cost for County roads				\$145,000
	Subtotal for roads				\$407,000
	Operation and maintenance during construction, including contingencies				<u>14,000</u>
	Total for roads				\$421,000
.3	<u>Cemeteries, Utilities, and Structures</u>				
	Cemeteries				
	Cemeteries, grave relocations	sum	job		<u>\$100,000</u>
	Subtotal for cemeteries				\$100,000
	Contingencies				<u>15,000</u>
	Total for cemeteries				\$115,000
	Utilities				
	Power line relocation	sum	job		\$ 25,500
	Telephone line relocation	sum	job		<u>13,100</u>
	Subtotal for utilities				\$ 38,600
	Contingencies				<u>5,400</u>
	Total for utilities				\$ 44,000
	Total for cemeteries, utilities and structures				\$159,000
	TOTAL FOR RELOCATIONS				\$580,000

TABLE T-18 (Cont'd)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
03.	<u>RESERVOIRS</u>				(\$ 60,000)
	Bridge removal	sum	job		\$ 5,000
	Clearing, untimbered	500	acre	25.00	12,500
	Clearing, timbered	200	acre	175.00	35,000
	Subtotal for reservoirs				\$ 52,500
	Contingencies				7,500
	TOTAL FOR RESERVOIRS				\$ 60,000
04.	<u>DAMS</u>				(\$2,593,000)
	Cofferdam, 1st stage				
	Embankment	48,200	cu.yd.	0.55	\$ 26,510
	Embankment removal	48,200	cu.yd.	0.25	12,050
	Unwatering	sum	job		30,000
	Care of water	sum	job		25,000
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		15,000
	Subtotal for cofferdams				\$ 134,560
	Spillway				
	Excavation, common	13,700	cu.yd.	0.45	\$ 6,165
	Excavation, core trench	1,600	cu.yd.	0.50	800
	Excavation, rock	7,600	cu.yd.	5.00	38,000
	Backfill, structures	2,390	cu.yd.	1.50	3,585
	Backfill, core trench, impervious material	1,600	cu.yd.	1.40	2,240
	Crushed stone, under stilling basin and chute floor	5,050	ton	4.00	20,200
	Riprap in exit channel	2,120	ton	5.50	11,660
	Bedding material in exit channel	1,390	ton	4.50	6,255
	Concrete, reinf., overflow section	220	cu.yd.	45.00	9,900
	Concrete, reinf., abutment walls	300	cu.yd.	45.00	13,500
	Concrete, reinf., approach walls	510	cu.yd.	45.00	22,950
	Concrete, reinf., chute walls	3,000	cu.yd.	45.00	135,000

TABLE T-18 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Concrete, reinf., training walls	2,100	cu.yd.	45.00	\$ 94,500
	Concrete, reinf., wing walls	90	cu.yd.	45.00	4,050
	Concrete, lightly reinf., chute floor	1,180	cu.yd.	42.00	49,560
	Concrete, lightly reinf., stilling basin floor	450	cu.yd.	40.00	18,000
	Steel, concrete reinforcing	1,100,000	lb.	0.15	165,000
	Drilling 1-1/2" Dia. grout holes	500	lin.ft.	4.50	2,250
	Grout	500	cu.ft.	5.00	<u>2,500</u>
	Subtotal for spillway				\$606,115
	Outlet works				
	Excavation, common	8,000	cu.yd.	0.45	\$ 3,600
	Excavation, approach and discharge channels	14,000	cu.yd.	0.50	7,000
	Excavation, rock	550	cu.yd.	5.00	2,750
	Backfill	5,100	cu.yd.	1.25	6,375
	Riprap, approach and discharge channels	280	ton	5.50	1,540
	Bedding material, approach and discharge channels	130	ton	4.50	585
	Concrete, mass, approach walls	50	cu.yd.	35.00	1,750
	Concrete, reinf., stilling basin	120	cu.yd.	45.00	5,400
	Concrete, reinf., conduit	1,050	cu.yd.	45.00	47,250
	Concrete, reinf., riser	40	cu.yd.	50.00	2,000
	Sluice gate, 30" x 30", 50' head, complete	1	each	1200.00	1,200
	Steel, concrete reinforcing	179,000	lb.	0.15	26,850
	Generator, 2500 W and power wrench	sum	job		<u>2,100</u>
	Subtotal for outlet works				\$108,400

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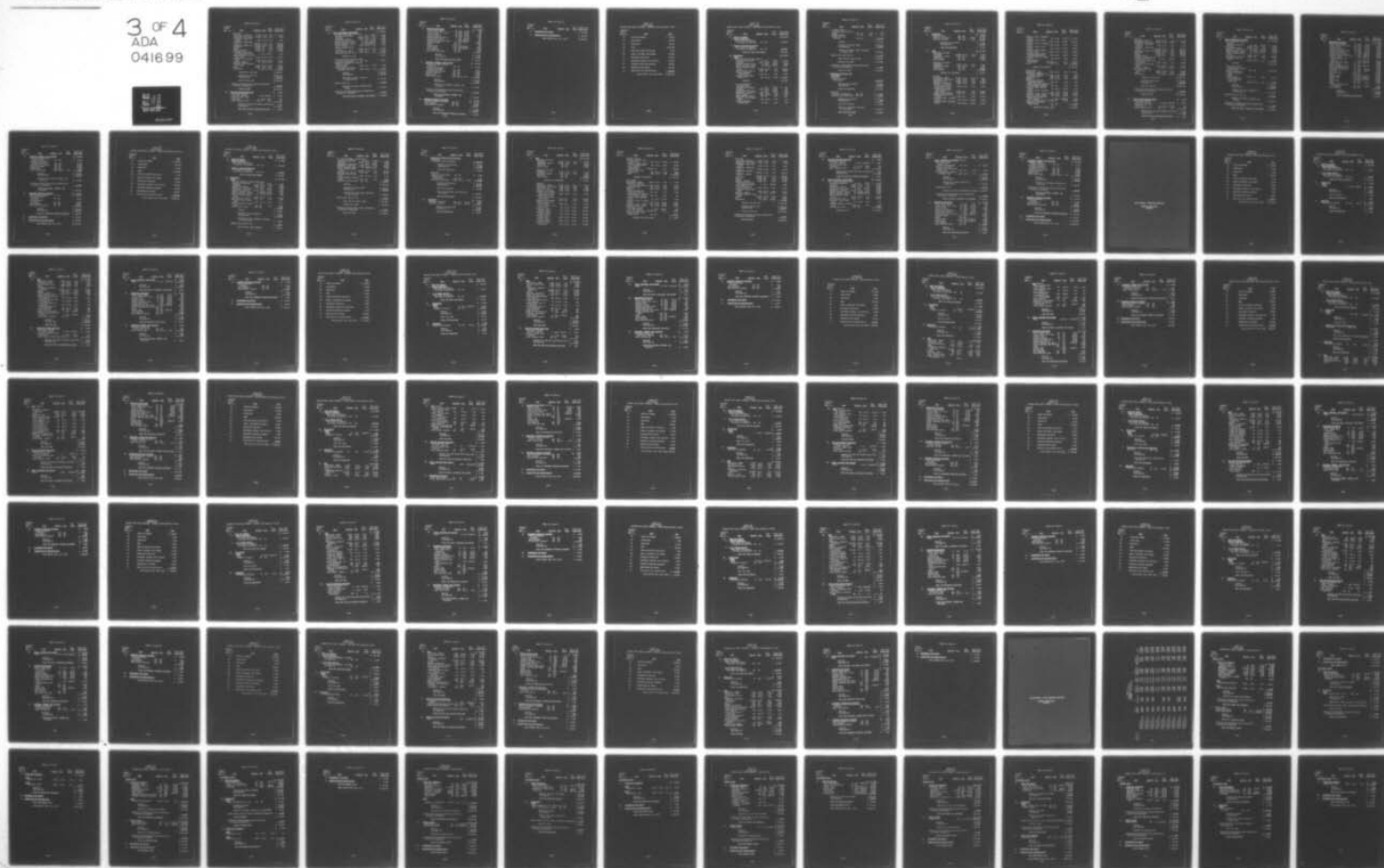
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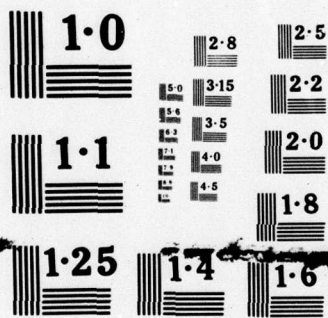
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NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART

TABLE T-18 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Earth dam				
	Stripping, foundation	57,100	cu.yd.	0.45	\$ 25,695
	Excavation, core trench	14,700	cu.yd.	0.50	7,350
	Excavation, inspection trench	3,200	cu.yd.	0.50	1,600
	Embankment, impervious fill	640,000	cu.yd.	0.75	480,000
	Embankment, random fill	214,000	cu.yd.	0.70	149,800
	Sand drain	122,000	ton	3.50	427,000
	Riprap	20,600	ton	5.50	113,300
	Bedding material	8,600	ton	4.50	38,700
	Mulching, fertilizing and seeding dam slope	8	acre	200.00	1,600
	Road surfacing, A-3, w/10" stone base	6,450	sq.yd.	3.60	23,220
	Guardrail, steel w/wood posts	4,840	lin.ft.	3.25	15,730
	Clearing, damsite	40	acre	175.00	7,000
	Drilling 1-1/2" diameter grout holes	8,400	lin.ft.	4.50	37,800
	Grout	8,400	cu.ft.	5.00	42,000
	Piezometers	36	each	270.00	9,720
	Subtotal for earth dam				\$1,380,515
	Subtotal for main dam				\$2,229,590
	Contingencies				305,410
	Total for main dam				\$2,535,000
	Operation and maintenance during construction, including contingencies				58,000
	TOTAL FOR DAMS				\$2,593,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate, 30"x30", 50' head, complete	2	each	1250.00	\$ 2,500
	Concrete, reinf., gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinf.	300	lb.	0.15	45
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				355
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000

TABLE T-18 (Cont'd)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
08.	ROADS, RAILROADS, AND BRIDGES				(\$ 168,000)
	A-1, East & West Road to Damsite				
	Clearing and grubbing	7	acre	175.00	\$ 1,225
	Stripping	12,800	cu.yd.	0.45	5,760
	Excavation, class A	4,800	cu.yd.	1.00	4,800
	Seeding and fertilizing	5	acre	200.00	1,000
	Machine grading, class I	20	station	110.00	2,200
	Machine grading, class II	20	station	150.00	3,000
	Fence, removal	2,300	lin.ft.	0.50	1,150
	Fence, 4-strand w/wood posts	8,200	lin.ft.	1.75	14,350
	Base material, type I	3,220	ton	3.50	11,270
	Bituminous road mix (A-3)	9,100	sq.yd.	0.45	<u>4,095</u>
	Subtotal for A-1				\$ 48,850
	Local access roads, parking areas, grounds, and guardrail	sum	job		\$ 70,000
	Storage and maintenance, parking and work areas:				
	Crushed stone	2,300	ton	4.00	9,200
	A-2 bituminous surfacing w/crushed stone base	4,800	sq.yd.	1.65	<u>7,920</u>
	Subtotal				\$ 135,970
	Contingencies				<u>20,030</u>
	Subtotal for roads, exclusive of right-of-way				\$ 156,000
	Right-of-way cost				<u>8,000</u>
	Subtotal for roads, railroads, and bridges				\$ 164,000
	Operation and maintenance during construction, including contingencies				<u>4,000</u>
	TOTAL FOR ROADS, RAILROADS, AND BRIDGES				\$ 168,000

TABLE T-18 (Cont'd)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
14.	<u>RECREATION FACILITIES</u>				(\$ 50,000)
	Picnic tables (PT-2)	10	each	55.00	\$ 550
	Picnic tables (PT-1 conc.)	10	each	75.00	750
	Concrete pads	10	each	150.00	1,500
	Barbecue braziers	20	each	65.00	1,300
	Refuse containers (SR-1)	7	each	45.00	315
	Incinerators (SI-2)	1	each	300.00	300
	Comfort stations (SC-2 mod.)	1	each	6000.00	6,000
	Launching ramps	sum	job		15,000
	Signs	sum	job		385
	Parking areas	0.33	acres	15000.00	5,000
	Access roads	0.60	miles	15000.00	9,000
	Tent campsites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		2,400
	Subtotal				\$ 43,500
	Contingencies				6,500
	TOTAL FOR RECREATION FACILITIES				\$ 50,000
19.	<u>BUILDINGS, GROUNDS, AND UTILITIES</u>				(\$ 182,000)
	Equipment storage building (100'x30')	sum	job		\$ 10,000
	Equipment maintenance building (50'x30')	sum	job		9,000
	Administration building	sum	job		75,000
	Overlook building	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	5,800
	Subtotal				\$ 137,800
	Contingencies				21,200
	Subtotal for buildings, grounds, and utilities				\$ 159,000
	Operation and maintenance during construction, including contingencies				23,000
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 182,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 81,000)
	Ground maintenance equipment	sum	job		\$ 19,750
	Shop equipment	sum	job		12,000
	Miscellaneous equipment	sum	job		38,600
	Subtotal				\$ 70,350
	Contingencies				10,650
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 81,000

TABLE T-18 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
30.	<u>ENGINEERING AND DESIGN</u>				\$ 651,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 366,000
	TOTAL PROJECT COST (July 1963)				\$5,200,000

TABLE T-19
Cost estimate
Meramec River Basin, Missouri - Bourbeuse River Reservoir (I-38)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 725,000
02	Relocations	279,000
03	Reservoirs	89,000
04	Dams	2,516,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	314,000
14	Recreation facilities	313,000
19	Buildings, grounds, and utilities	194,000
20	Permanent operating equipment	160,000
30	Engineering and design	641,000
31	Supervision and administration	<u>376,000</u>
Total project cost (July 1963)		\$5,610,000

TABLE T-19
Cost estimate
Meramec River Basin, Missouri - Bourbeuse River Reservoir (I-38)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$725,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$594,000
.2	<u>Bureau of Outdoor Recreation</u>				
	Total lands and damages, including contingencies	sum	job		<u>131,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$725,000
02.	<u>RELOCATIONS</u>				(\$279,000)
.1	<u>Roads</u>				
	C-1, County Road at State Hwy H				
	Clearing and grubbing	9	acre	175.00	\$ 1,575
	Stripping	15,100	cu.yd.	0.45	6,795
	Seeding and fertilizing	8	acre	200.00	1,600
	Machine grading, class I	60	station	110.00	6,600
	Fence, 4-strand w/wood posts	11,600	lin.ft.	1.75	20,300
	Base material, type II	5,460	ton	4.00	21,840
	Surface aggregate, crushed stone	1,500	ton	4.00	6,000
	Concrete pipe culvert, class V, 54"	150	lin.ft.	30.00	<u>4,500</u>
	Subtotal				\$ 69,210
	C-2, County Road at Bourbeuse River				
	Clearing and stripping	2	acre	175.00	\$ 350
	Stripping	1,230	cu.yd.	0.45	554
	Seeding and fertilizing	1	acre	200.00	200
	Embankment, compacted	2,000	cu.yd.	0.75	1,500
	Fence, removal	660	lin.ft.	0.50	330
	Base material, type II	420	ton	4.00	1,680
	Guardrail, steel w/wood posts	140	lin.ft.	3.25	455
	Surface aggregate, crushed stone	90	ton	4.50	405

TABLE T-19 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	C-2 County Road at Bourbeuse River (cont'd)				
	Riprap	40	ton	5.00	\$ 200
	Bedding material	20	ton	4.50	90
	Bridge, concrete, 200'x20'	sum	job		<u>32,000</u>
	Subtotal				\$ 37,764
	Subtotal for County roads				\$ 106,974
	Contingencies				<u>16,026</u>
	Subtotal for County roads, exclusive of right-of-way				\$ 123,000
	Right-of-way costs for C-1				<u>6,000</u>
	Total cost for County roads				\$ 129,000
	Subtotal for roads				\$ 129,000
	Operation and maintenance during construction, including contingencies				<u>5,000</u>
	Total for roads				\$ 134,000
.3	<u>Cemeteries, Utilities, and Structures</u>				
	Cemeteries				
	Cemeteries, grave relocations				<u>\$ 100,000</u>
	Subtotal for cemeteries				\$ 100,000
	Contingencies				<u>15,000</u>
	Total for cemeteries				\$ 115,000
	Utilities				
	Power line relocations	sum	job		\$ 16,900
	Telephone line relocations	sum	job		<u>9,200</u>
	Subtotal for utilities				\$ 26,100
	Contingencies				<u>3,900</u>
	Total for utilities				\$ 30,000
	Total for cemeteries, utilities, and structures				\$ 145,000
	TOTAL FOR RELOCATIONS				\$ 279,000

TABLE T-19 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
03.	<u>RESERVOIRS</u>				(\$ 89,000)
	Bridge removal	sum	job		\$ 10,000
	Clearing, untimbered	600	acre	25.00	15,000
	Clearing, timbered	300	acre	175.00	<u>52,500</u>
	Subtotal for reservoirs				\$ 77,500
	Contingencies				<u>11,500</u>
	TOTAL FOR RESERVOIRS				\$ 89,000
04.	<u>DAMS</u>				(\$2,516,000)
	Cofferdam, 1st stage				
	Embankment	12,400	cu.yd.	0.55	\$ 6,820
	Embankment, removal	12,400	cu.yd.	0.25	3,100
	Unwatering	sum	job		20,000
	Care of water	sum	job		<u>15,000</u>
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		<u>15,000</u>
	Subtotal for cofferdams				\$ 85,920
	Spillway				
	Excavation, common	14,500	cu.yd.	0.45	\$ 6,525
	Excavation, core trench	1,600	cu.yd.	0.50	800
	Excavation, rock	10,000	cu.yd.	5.00	50,000
	Backfill, structures	3,000	cu.yd.	1.50	4,500
	Backfill, core trench, impervious material	1,600	cu.yd.	1.40	2,240
	Crushed stone, under stilling basin and chute floor	6,330	ton	4.50	28,485
	Riprap in exit channel	2,120	ton	5.50	11,660
	Bedding material in exit channel	1,390	ton	5.00	6,950
	Concrete, reinf., overflow section	220	cu.yd.	45.00	9,900
	Concrete, reinf., abutment walls	300	cu.yd.	45.00	<u>13,500</u>

TABLE T-19 (Cont'd)

Classifi-
cation
No.

<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
Concrete, reinf., approach walls	510	cu.yd.	45.00	\$ 22,950
Concrete, reinf., chute walls	3,500	cu.yd.	45.00	157,500
Concrete, reinf., training walls	1,720	cu.yd.	45.00	77,400
Concrete, reinf., wing walls	340	cu.yd.	45.00	15,300
Concrete, lightly reinf., chute floor	1,680	cu.yd.	42.00	70,560
Concrete, lightly reinf., stilling basin floor	390	cu.yd.	40.00	15,600
Drilling 1-1/2" dia. grout holes	500	lin.ft.	4.50	2,250
Steel, concrete reinforcing	1,200,000	lb.	0.15	180,000
Grout	500	cu.ft.	5.00	<u>2,500</u>
Subtotal for spillway				\$ 678,620
Outlet works				
Excavation, common	7,600	cu.yd.	0.45	\$ 3,420
Excavation, approach and discharge channels	15,000	cu.yd.	0.50	7,500
Excavation, rock	600	cu.yd.	5.00	3,000
Backfill	4,700	cu.yd.	1.25	5,875
Riprap, approach and discharge channels	280	ton	5.50	1,540
Bedding, material, approach and discharge channels	130	ton	5.00	650
Concrete, mass, approach walls	40	cu.yd.	35.00	1,400
Concrete, reinf., stilling basin	150	cu.yd.	45.00	6,750
Concrete, reinf., conduit	1,350	cu.yd.	45.00	60,750
Concrete, reinf., riser	30	cu.yd.	50.00	1,500
Sluice gate, 42"x42", 30' head, complete	1	each	2,000.00	2,000
Steel, concrete, reinf.	226,000	lb.	0.15	33,900
Generator, 2500 W and power wrench	sum	job		<u>2,100</u>
Subtotal for outlet works				\$ 130,385

TABLE T-19 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Total esti- mated cost</u>
	Earth dam				
	Stripping, foundation	57,000	cu.yd.	0.45	\$ 25,650
	Excavation, core trench	14,800	cu.yd.	0.50	7,400
	Excavation, inspection trench	5,200	cu.yd.	0.50	2,600
	Embankment, impervious fill	600,000	cu.yd.	0.75	450,000
	Embankment, random fill	160,000	cu.yd.	0.70	112,000
	Sand drain	95,000	ton	4.00	380,000
	Riprap	16,100	ton	5.50	88,550
	Bedding material	6,700	ton	5.00	33,500
	Mulching, fertilizing and seeding dam slope	20	acre	200.00	4,000
	Road surfacing, A-3 w/10" stone base	8,280	sq.yd.	3.60	29,808
	Guardrail, steel w/wood posts	6,210	lin.ft.	3.25	20,183
	Clearing, dams site	40	acre	175.00	7,000
	Drilling 1-1/2" dia. grout holes	8,900	lin.ft.	4.50	40,050
	Grout	8,900	cu.ft.	5.00	44,500
	Piezometers	45	each	270.00	12,150
	Subtotal for earth dam				\$1,257,391
	Subtotal for main dam				\$2,152,316
	Contingencies				294,684
	Total for main dam				\$2,447,000
	Operation and maintenance during construction, including contingencies				69,000
	TOTAL FOR DAMS				\$2,516,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate, 30"x30", 50' head, complete	2	each	1,250.00	\$ 2,500
	Concrete, reinf., gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinf.	300	lb.	0.15	45
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				355
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000

TABLE T-19 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
08.	<u>ROADS, RAILROADS, AND BRIDGES</u>				(\$ 314,000)
	A-1, Access Road to Dam				
	Spillway				
	Clearing and grubbing	20	acre	175.00	\$ 3,500
	Stripping	26,900	cu.yd.	0.45	12,105
	Excavation, class A	18,700	cu.yd.	1.00	18,700
	Seeding and fertilizing	10	acre	200.00	2,000
	Machine grading, class I	100	station	110.00	11,000
	Fence, 4-strand w/wood posts	19,300	lin.ft.	1.75	33,775
	Base material, type II	9,300	ton	4.00	37,200
	Bituminous road mix (A-3)	25,400	sq.yd.	0.45	<u>11,430</u>
	Subtotal				\$ 129,710
	Local access roads, parking areas, grounds, and guardrail	sum	job		\$ 100,000
	Storage, maintenance, parking, and work areas:				
	Crushed stone	3,400	ton	4.50	15,300
	A-2 bituminous surfacing w/crushed stone base	4,800	sq.yd.	1.65	<u>7,920</u>
	Subtotal				\$ 252,930
	Contingencies				<u>38,070</u>
	Subtotal for roads, exclusive of right-of-way				\$ 291,000
	Right-of-way cost for A-1				<u>16,000</u>
	Subtotal for roads, railroads, and bridges				\$ 307,000
	Operation and maintenance during construction, including contingencies				<u>7,000</u>
	TOTAL FOR ROADS, RAILROADS, AND BRIDGES				\$ 314,000

TABLE T-19 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
14.	<u>RECREATION FACILITIES</u>				(\$ 313,000)
	Picnic tables (PT-2)	40	each	55.00	\$ 2,200
	Picnic tables (PT-1 conc.)	45	each	75.00	3,375
	Concrete pads	70	each	150.00	10,500
	Barbecue braziers	85	each	65.00	5,525
	Refuse containers (SR-1)	45	each	45.00	2,025
	Incinerators (SI-2)	8	each	300.00	2,400
	Comfort stations (SC-1)	1	each	8,000.00	8,000
	Comfort stations (SC-2) mod.	4	each	6,000.00	24,000
	Shelters (PS-1)	2	each	2,300.00	4,600
	Central washhouse and showers	1	each	12,000.00	12,000
	Sewage treatment system	1	each	8,000.00	8,000
	Sewage lines	sum	job		3,500
	Wells w/pressure tanks	2	each	10,000.00	20,000
	Water distribution lines	sum	job		9,400
	Fountains and hydrants	11	each	900.00	9,900
	Dry wells	11	each	500.00	5,500
	Launching ramps	sum	job		30,000
	Signs	sum	job		3,000
	Parking areas	1.50	acre	15,000.00	22,500
	Access roads	2.25	mile	15,000.00	33,750
	Paths	1.50	mile	8,000.00	12,000
	Sand blanket	sum	job		12,025
	Trees	80	each	30.00	2,400
	Seeding, mulching, and fertilizing	110	acre	160.00	17,600
	Tent campsites	sum	job		<u>8,000</u>
	Subtotal				\$ 272,200
	Contingencies				<u>40,800</u>
	TOTAL FOR RECREATION FACILITIES				\$ 313,000

TABLE T-19 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
19.	<u>BUILDING, GROUNDS, AND UTILITIES</u>				(\$ 194,000)
	Equipment storage build- ing (150'x30')	sum	job		\$ 15,000
	Equipment maintenance building (100'x30')	sum	job		15,000
	Administration building	sum	job		75,000
	Overlook building	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	<u>5,800</u>
	Subtotal				\$ 148,800
	Contingencies				<u>22,200</u>
	Subtotal for buildings, grounds, and utilities				\$ 171,000
	Operation and maintenance during construction, including contingencies				<u>23,000</u>
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 194,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 160,000)
	Fire fighting equipment	sum	job		\$ 20,000
	Ground maintenance equipment	sum	job		34,250
	Road maintenance equipment	sum	job		17,500
	Shop equipment	sum	job		13,400
	Miscellaneous equipment	sum	job		<u>54,100</u>
	Subtotal				\$ 139,250
	Contingencies				<u>20,750</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 160,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 641,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 376,000
	TOTAL PROJECT COST (July 1963)				\$5,610,000

TABLE T-20
Cost estimate
Meramec River Basin, Missouri - Benton Creek Reservoir (I-41)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 167,000
02	Relocations	513,000
03	Reservoirs	16,000
04	Dams	1,558,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	254,000
14	Recreation facilities	50,000
19	Buildings, grounds, and utilities	182,000
20	Permanent operating equipment	81,000
30	Engineering and design	566,000
31	Supervision and administration	<u>290,000</u>
Total project cost (July 1963)		\$3,680,000

TABLE T-20
Cost estimate
Meramec River Basin, Missouri - Benton Creek Reservoir (I-41)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.	<u>LANDS AND DAMAGES</u>				(\$ 167,000)
-.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 144,000
.2	<u>Bureau of Outdoor Recreation</u>				
	Total lands and damages, including contingencies	sum	job		<u>23,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 167,000
02.	<u>RELOCATIONS</u>				(\$ 513,000)
.1	<u>Roads</u>				
	S-1 State Highway at Benton Creek South				
	Clearing and grubbing	7	acre	175.00	\$ 1,225
	Stripping	10,300	cu.yd.	0.45	4,635
	Excavation, class A	2,900	cu.yd.	1.00	2,900
	Seeding and fertilizing	3	acre	200.00	600
	Embankment, compacted	40,700	cu.yd.	0.75	30,525
	Machine grading, class I	3	station	110.00	330
	Machine grading, class II	10	station	150.00	1,500
	Fence, 4-strand w/wood posts	5,000	lin.ft.	1.75	8,750
	Base material, type II	1,960	ton	4.00	7,840
	Guardrail, steel w/wood posts	1,100	lin.ft.	3.25	3,575
	Surface aggregate, crushed stone	650	ton	4.00	2,600
	Concrete box culvert	sum	job		<u>1,800</u>
	Subtotal				\$ 66,280
	Subtotal for state highways				\$ 66,280
	Contingencies				<u>9,720</u>
	Subtotal for state highways, exclusive of right-of-way				\$ 76,000
	Right-of-way costs for S-1				<u>2,000</u>
	Total cost for state highways				\$ 78,000

TABLE T-20 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
C-1, County Highway at Benton Creek					
	Clearing and grubbing	10	acre	175.00	\$ 1,750
	Stripping	28,200	cu.yd.	0.45	12,690
	Seeding and fertilizing	10	acre	200.00	2,000
	Embankment, compacted	40,700	cu.yd.	0.75	30,525
	Machine grading, class I	80	station	110.00	8,800
	Fence, 4-strand w/wood posts	18,900	lin.ft.	1.75	33,075
	Base material, type II	7,350	ton	4.00	29,400
	Guardrail, steel w/wood posts	2,500	lin.ft.	3.25	8,125
	Surface aggregate, crushed stone	2,450	ton	4.00	9,800
	Bridge over Benton Creek	sum	job		<u>45,000</u>
	Subtotal				\$ 181,165
	Subtotal for county roads				\$ 181,165
	Contingencies				<u>27,335</u>
	Subtotal for county roads, exclusive of right-of-way				\$ 208,500
	Right-of-way costs for C-1				<u>4,500</u>
	Total cost for county roads				\$ 213,000
	Subtotal for roads				\$ 291,000
	Operation and maintenance during construction, including contingencies				<u>8,000</u>
	Total for roads				\$ 299,000

TABLE T-20 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
.3	<u>Cemeteries, Utilities, and Structures</u>				
	<u>Cemeteries</u>				
	Cemeteries, grave relocation				\$ 100,000
	Subtotal for cemeteries				\$ 100,000
	Contingencies				<u>15,000</u>
	Total for cemeteries				\$ 115,000
	<u>Utilities</u>				
	Power line relocations	sum	job		\$ 3,800
	Telephone line				
	relocations	sum	job		2,500
	Pipe line alterations	5,920	lin.ft.	13.50	<u>79,920</u>
	Subtotal for utilities				\$ 86,220
	Contingencies				<u>12,780</u>
	Total for utilities				\$ 99,000
	Total for cemeteries, utilities, and structures				\$ 214,000
	TOTAL FOR RELOCATIONS				\$ 513,000
03.	<u>RESERVOIRS</u>				
	Clearing, untimbered	200	acre	25.00	(\$ 16,000) \$ 5,000
	Clearing, timbered	50	acre	175.00	<u>8,750</u>
	Subtotal for reservoirs				\$ 13,750
	Contingencies				<u>2,250</u>
	TOTAL FOR RESERVOIRS				\$ 16,000

TABLE T-20 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
04.	DAMS				(\$1,558,000)
	Cofferdam, 1st stage				
	Embankment	24,400	cu.yd.	0.55	\$ 13,420
	Embankment removal	24,400	cu.yd.	0.25	6,100
	Unwatering	sum	job		20,000
	Care of water	sum	job		15,000
	Cofferdam, 2nd stage				
	Embankment	7,500	cu.yd.	0.55	4,125
	Embankment removal	7,500	cu.yd.	0.25	1,875
	Unwatering	sum	job		20,000
	Care of water	sum	job		<u>15,000</u>
	Subtotal for cofferdams				\$ 95,520
	Spillway				
	Excavation, common	8,700	cu.yd.	0.45	\$ 3,915
	Excavation, core trench	1,600	cu.yd.	0.50	800
	Excavation, rock	7,500	cu.yd.	5.00	37,500
	Backfill, structures	1,600	cu.yd.	1.50	2,400
	Backfill, core trench, impervious material	1,600	cu.yd.	1.40	2,240
	Crushed stone, under stilling basin and chute floor	3,100	ton	4.00	12,400
	Riprap in exit channel	2,120	ton	5.50	11,660
	Bedding material in exit channel	1,400	ton	4.50	6,300
	Concrete, reinf., over- flow section	240	cu.yd.	45.00	10,800
	Concrete, reinf., abutment walls	310	cu.yd.	45.00	13,950
	Concrete, reinf., approach walls	460	cu.yd.	45.00	20,700
	Concrete, reinf., chute walls	1,800	cu.yd.	45.00	81,000
	Concrete, reinf., training walls	1,500	cu.yd.	45.00	67,500
	Concrete, reinf., wing walls	880	cu.yd.	45.00	39,600

TABLE T-20 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Spillway (cont'd)				
	Concrete, lightly reinf., chute floor	560	cu.yd.	42.00	\$ 23,520
	Concrete, lightly reinf., stilling basin floor	300	cu.yd.	40.00	12,000
	Steel, concrete reinforcing	870,000	lb.	0.15	130,500
	Drilling 1-1/2" dia. grout holes	500	lin.ft.	4.50	2,250
	Grout	500	cu.ft.	5.00	<u>2,500</u>
	Subtotal for spillway				\$ 481,535
	Outlet Works				
	Excavation, common	5,800	cu.yd.	0.45	\$ 2,610
	Excavation, approach and discharge channels	13,500	cu.yd.	0.50	6,750
	Excavation, rock	250	cu.yd.	5.00	1,250
	Backfill	4,100	cu.yd.	1.25	5,125
	Riprap, approach and discharge channels	270	ton	5.50	1,485
	Bedding material, approach and discharge channels	120	ton	4.50	540
	Concrete, mass, approach walls	50	cu.yd.	35.00	1,750
	Concrete, reinf., stilling basin	100	cu.yd.	45.00	4,500
	Concrete, reinf., conduit	610	cu.yd.	45.00	27,450
	Concrete, reinf., riser	20	cu.yd.	50.00	1,000
	Sluice gate, 21"x21", 30' head complete	1	each	800.00	800
	Steel, concrete reinf.	110,000	lb.	0.15	16,500
	Generator, 2500 W and power wrench	sum	job		<u>2,100</u>
	Subtotal for outlet works				\$ 71,860

TABLE T-20 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
	Earth dam				
	Stripping, foundation	31,900	cu.yd.	0.45	\$ 14,355
	Excavation, core trench	6,600	cu.yd.	0.50	3,300
	Excavation, inspection trench	3,800	cu.yd.	0.50	1,900
	Embankment, impervious fill	81,300	cu.yd.	0.75	60,975
	Embankment, pervious fill	160,000	cu.yd.	0.65	104,000
	Embankment, random fill	160,000	cu.yd.	0.70	112,000
	Sand drain	79,000	ton	2.50	197,500
	Riprap	13,000	ton	5.50	71,500
	Bedding, material	5,000	ton	4.50	22,500
	Mulching, fertilizing and seeding dam slope	9	acre	200.00	1,800
	Road surfacing, A-3, w/10" stone base	4,750	sq.yd.	3.60	17,100
	Guardrail, steel w/wood posts	3,560	lin.ft.	3.25	11,570
	Clearing, damsite	20	acre	175.00	3,500
	Drilling 1-1/2" dia. grout holes	5,400	lin.ft.	4.50	24,300
	Grout	5,400	cu.ft.	5.00	27,000
	Piezometers	27	each	270.00	7,290
	Subtotal for earth dam				\$ 680,590
	Subtotal for main dam				\$1,329,505
	Contingencies				<u>182,495</u>
	Total for main dam				\$1,512,000
	Operation and maintenance during construction, including contingencies				<u>46,000</u>
	TOTAL FOR DAMS				\$1,558,000

TABLE T-20 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate, 30"x30", 50' head, complete	2	each	1,250.00	\$ 2,500
	Concrete, reinf., gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinf.	300	lb.	0.15	<u>45</u>
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				<u>355</u>
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000
08.	<u>ROADS, RAILROADS, AND BRIDGES</u>				(\$ 254,000)
	A-1, Access Road Benton Creek				
	Clearing and grubbing	20	acre	175.00	\$ 3,500
	Stripping	25,400	cu.yd.	0.45	11,430
	Excavation, class A	14,800	cu.yd.	1.00	14,800
	Seeding and fertilizing	8	acre	200.00	1,600
	Embankment, compacted	52,000	cu.yd.	0.75	39,000
	Machine grading, class I	20	station	110.00	2,200
	Machine grading, class II	40	station	150.00	6,000
	Fence, 4-strand w/wood posts	15,300	lin.ft.	1.75	26,775
	Base material, type I	3,220	ton	3.50	11,270
	Guardrail, steel w/wood posts	300	lin.ft.	3.25	975
	Surface aggregate, crushed stone	1,050	ton	4.00	4,200
	Concrete box culvert	sum	job		<u>3,700</u>
	Subtotal for A-1				\$ 125,450

TABLE T-20 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>ROADS, RAILROADS AND BRIDGES</u> (cont'd)					
	Local access roads, parking areas, grounds, and guardrail	sum	job		\$ 70,000
	Storage, maintenance, parking, and work areas:				
	Crushed stone	2,300	ton	4.00	9,200
	A-2 bituminous surfacing w/crushed stone	4,800	sq.yd.	1.65	<u>7,920</u>
	Subtotal				\$ 212,570
	Contingencies				<u>31,930</u>
	Subtotal for roads, exclusive of right-of-way				\$ 244,500
	Right-of-way cost				<u>5,500</u>
	Subtotal for roads, railroads and bridges				\$ 250,000
	Operation and maintenance during construction, including contingencies				<u>4,000</u>
	TOTAL FOR ROADS, RAILROADS, AND BRIDGES				\$ 254,000
14.	<u>RECREATION FACILITIES</u>				(\$ 50,000)
	Picnic tables (PT-2)	10	each	55.00	\$ 550
	Picnic tables (PT-1 conc.)	10	each	75.00	750
	Concrete pads	10	each	150.00	1,500
	Barbecue braziers	20	each	65.00	1,300
	Refuse containers (SR-1)	7	each	45.00	315
	Incinerators (SI-2)	1	each	300.00	300
	Comfort stations (SC-2) mod.	1	each	6,000.00	6,000
	Launching ramps	sum	job		15,000
	Signs	sum	job		385
	Parking areas	0.33	acre	15,000.00	5,000
	Access roads	0.60	mile	15,000.00	9,000
	Tent campsites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		<u>2,400</u>
	Subtotal				\$ 43,500
	Contingencies				<u>6,500</u>
	TOTAL FOR RECREATION FACILITIES				\$ 50,000

TABLE T-20 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
19.	<u>BUILDINGS, GROUNDS, AND UTILITIES</u>				(\$ 182,000)
	Equipment storage				
	building (100'x30')	sum	job		\$ 10,000
	Equipment maintenance				
	building (50'x30')	sum	job		9,000
	Administration building	sum	job		75,000
	Overlook building	sum	job		21,000
	Sewage plant	sum	job		17,000
	Chain link fencing	2,000	lin.ft.	2.90	<u>5,800</u>
	Subtotal				\$ 137,800
	Contingencies				<u>21,200</u>
	Subtotal for buildings, grounds, and utilities				\$ 159,000
	Operation and maintenance during construction, including contingencies				<u>23,000</u>
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 182,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 81,000)
	Ground maintenance				
	equipment	sum	job		\$ 19,750
	Shop equipment	sum	job		12,000
	Miscellaneous equipment	sum	job		<u>38,600</u>
	Subtotal				\$ 70,350
	Contingencies				<u>10,650</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 81,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 566,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 290,000
	TOTAL PROJECT COST (July 1963)				\$3,680,000

COST ESTIMATE - HEADWATER RESERVOIRS

**MERAMEC RIVER BASIN,
MISSOURI**

TABLE T-21
Cost estimate
Meramec River Basin, Missouri - Dry Creek Reservoir (H-3)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 161,000
02	Relocations	5,000
03	Reservoirs	6,000
04	Dams	124,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	8,000
14	Recreation facilities	25,000
19	Buildings, grounds, and utilities	5,000
20	Permanent operating equipment	7,000
30	Engineering and design	46,000
31	Supervision and administration	<u>29,000</u>
Total project cost (July 1963)		\$ 419,000

TABLE T-21
Cost estimate
Meramec River Basin, Missouri - Dry Creek Reservoir (H-3)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$ 161,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages including contingencies	sum	job		\$ 84,000
.2	<u>U. S. Forest Service</u>				
	Total lands and damages including contingencies	sum	job		<u>77,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 161,000
02.	<u>RELOCATIONS</u>				(\$ 5,000)
.1	<u>Roads</u>				
	Roads	.50	mile	8,000.00	<u>\$ 4,000</u>
	Subtotal				\$ 4,000
	Contingencies				<u>1,000</u>
	Total for roads				\$ 5,000
	TOTAL FOR RELOCATIONS				\$ 5,000
03.	<u>RESERVOIRS</u>				(\$ 6,000)
	Cleearing and grubbing	30	acre	175.00	<u>\$ 5,250</u>
	Subtotal				\$ 5,250
	Contingencies				<u>750</u>
	TOTAL FOR RESERVOIRS				\$ 6,000

TABLE T-21 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
04.	<u>DAMS</u>				(\$ 124,000)
	Excavation, common	2,660	cu.yd.	0.45	\$ 1,197
	Excavation, rock	90	cu.yd.	5.00	450
	Drilling grout holes	1,800	lin.ft.	4.50	8,100
	Grout	1,800	cu.ft.	5.00	9,000
	Embankment, compacted, impervious	90,200	cu.yd.	0.75	67,650
	Riprap	1,000	ton	5.00	5,000
	Concrete, reinf.	90	cu.yd.	85.00	7,650
	Steel, concrete reinf.	4,040	lb.	0.20	808
	Reinforced concrete pipe, 36" diameter	210	lin.ft.	13.00	2,730
	Reinforced concrete pipe, 12" diameter	60	lin.ft.	4.00	240
	Hel-Cor metal pipe, 6", perforated	150	lin.ft.	3.50	525
	Hel-Cor metal pipe, 6", non-perforated	100	lin.ft.	3.50	350
	Filter material	190	ton	5.00	950
	Trash rack or guardrails	1	each	400.00	400
	Mulching, fertilizing, and seeding	9	acre	200.00	1,800
	Sluice gates, complete	sum	job		<u>800</u>
	Subtotal				\$ 107,650
	Contingencies				<u>16,350</u>
	TOTAL FOR DAMS				\$ 124,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate, 30"x30", 50' head, complete	2	each	1,250.00	\$ 2,500
	Concrete, reinforced, gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinforcing	300	lb.	0.15	<u>45</u>
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				<u>355</u>
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000

TABLE T-21 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
08.	<u>ROADS, RAILROADS, AND BRIDGES</u>				(\$ 8,000)
	Roads	.50	mile	14,000.00	\$ 7,000
	Subtotal				\$ 7,000
	Contingencies				<u>1,000</u>
	TOTAL FOR ROADS, RAILROADS, AND BRIDGES				\$ 8,000
14.	<u>RECREATION FACILITIES</u>				(\$ 25,000)
	Picnic tables (PT-2)	10	each	55.00	\$ 550
	Picnic tables (PT-1 conc.)	10	each	75.00	750
	Concrete pads	10	each	150.00	1,500
	Barbeque brazier	20	each	65.00	1,300
	Refuse containers (SR-1)	7	each	45.00	315
	Incinerators (SI-2)	1	each	300.00	300
	Comfort stations (SC-2 mod.)	1	each	6,000.00	6,000
	Prefab launching ramp (BR-2)	sum	job		3,000
	Signs	sum	job		385
	Access roads	.50	mile	8,000.00	4,000
	Tent campsites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		<u>2,400</u>
	Subtotal				\$ 21,500
	Contingencies				<u>3,500</u>
	TOTAL FOR RECREATION FACILITIES				\$ 25,000
19.	<u>BUILDINGS, GROUNDS, AND UTILITIES</u>				(\$ 5,000)
	Equipment storage and maintenance building	sum	job		\$ 4,000
	Chain link fencing	200	lin.ft.	2.90	<u>580</u>
	Subtotal				\$ 4,580
	Contingencies				<u>420</u>
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 5,000

TABLE T-21 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 7,000)
	Ground maintenance equipment	sum	job	\$	1,000
-	Shop equipment	sum	job		500
	Miscellaneous equipment	sum	job		<u>4,780</u>
	Subtotal			\$	6,280
	Contingencies				<u>720</u>
	TOTAL FOR PERMENENT OPERATING EQUIPMENT			\$	7,000
30.	<u>ENGINEERING AND DESIGN</u>			\$	46,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>			\$	29,000
	TOTAL PROJECT COST (July 1963)			\$	419,000

TABLE T-22
Cost estimate

Meramec River Basin, Missouri - Cabanne Course Reservoir (H-4)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 178,000
02	Relocations	25,000
03	Reservoirs	8,000
04	Dams	337,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	5,000
14	Recreation facilities	25,000
19	Buildings, grounds, and utilities	5,000
20	Permanent operating equipment	7,000
30	Engineering and design	104,000
31	Supervision and administration	<u>43,000</u>
	Total project cost (July 1963)	\$ 740,000

TABLE T-22
Cost estimate
Meramec River Basin, Missouri - Cabanne Course Reservoir (H-4)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$ 178,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 82,000
.2	<u>U. S. Forest Service</u>				
	Total lands and damages, including contingencies	sum	job		<u>96,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 178,000
02.	<u>RELOCATIONS</u>				(\$ 25,000)
.1	<u>Roads</u>				
	Roads	.25	mile	8,000.00	\$ 2,000
	Bridges or culverts	sum	job		<u>20,000</u>
	Subtotal				\$ 22,000
	Contingencies				<u>3,000</u>
	Total for roads				\$ 25,000
	TOTAL FOR RELOCATIONS				\$ 25,000
03.	<u>RESERVOIRS</u>				(\$ 8,000)
	Clearing and grubbing	40	acre	175.00	<u>\$ 7,000</u>
	Subtotal				\$ 7,000
	Contingencies				<u>1,000</u>
	TOTAL FOR RESERVOIRS				\$ 8,000

TABLE T-22 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
04.	<u>DAMS</u>				(\$ 337,000)
	Excavation, common	4,560	cu.yd.	0.45	\$ 2,052
	Drilling grout holes	2,200	lin.ft.	4.50	9,900
	Grout	2,200	cu.ft.	5.00	11,000
	Embankment, compacted, impervious	228,000	cu.yd.	0.75	171,000
	Riprap	2,980	ton	5.00	14,900
	Concrete, reinforced	730	cu.yd.	85.00	62,050
	Steel, concrete reinf.	77,500	lb.	0.20	15,500
	Reinforced concrete pipe, 36" diameter	300	lin.ft.	13.00	3,900
	Reinforced concrete pipe, 12" diameter	90	lin.ft.	4.00	360
	Hel-Cor metal pipe, 6", perforated	140	lin.ft.	3.50	490
	Hel-Cor metal pipe, 6", non-perforated	200	lin.ft.	3.50	700
	Filter material	140	ton	5.00	700
	Trash rack or guardrails	1	each	400.00	400
	Mulching, fertilizing, and seeding	4	acre	200.00	800
	Sluice gates, complete	sum	job		<u>800</u>
	Subtotal				\$ 294,552
	Contingencies				<u>42,448</u>
	TOTAL FOR DAMS				\$ 337,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate, 30"x30", 50' head, complete	2	each	1,250.00	\$ 2,500
	Concrete, reinf., gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinf.	300	lb.	0.15	<u>45</u>
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				<u>355</u>
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000

TABLE T-22 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
08.	<u>ROADS, RAILROADS, AND BRIDGES</u>				(\$ 5,000)
	Roads	.25	mile	18,000.00	\$ 4,500
	Subtotal				\$ 4,500
	Contingencies				500
	TOTAL FOR ROADS, RAILROADS, AND BRIDGES				\$ 5,000
14.	<u>RECREATION FACILITIES</u>				(\$ 25,000)
	Picnic tables (PT-2)	10	each	55.00	\$ 550
	Picnic tables (PT-1 conc.)	10	each	75.00	750
	Concrete pads	10	each	150.00	1,500
	Barbeque brazier	20	each	65.00	1,300
	Refuse containers (SR-1)	7	each	45.00	315
	Incinerators (SI-2)	1	each	300.00	300
	Comfort stations (SC-2 mod.)	1	each	6,000.00	6,000
	Prefab launching ramp (BR-2)	sum	job		3,000
	Signs	sum	job		385
	Access roads	.50	mile	8,000.00	4,000
	Tent campsites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		2,400
	Subtotal				\$ 21,500
	Contingencies				3,500
	TOTAL FOR RECREATION FACILITIES				\$ 25,000
19.	<u>BUILDINGS, GROUNDS, AND UTILITIES</u>				(\$ 5,000)
	Equipment storage and maintenance building	sum	job		\$ 4,000
	Chain link fencing	200	lin.ft.	2.90	580
	Subtotal				\$ 4,580
	Contingencies				420
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 5,000

TABLE T-22 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 7,000)
	Ground maintenance equipment	sum	job	\$	1,000
	Shop equipment	sum	job		500
	Miscellaneous equipment	sum	job		<u>4,780</u>
	Subtotal			\$	6,280
	Contingencies				<u>720</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT			\$	7,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 104,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 43,000
	TOTAL PROJECT COST (July 1963)				\$ 740,000

TABLE T-23
Cost estimate
Meramec River Basin, Missouri - Brady Reservoir (H-5A)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 87,000
02	Relocations	26,000
03	Reservoirs	8,000
04	Dams	124,000
08	Roads, railroads, and bridges	2,000
14	Recreation facilities	25,000
19	Buildings, grounds, and utilities	5,000
20	Permanent operating equipment	7,000
30	Engineering and design	49,000
31	Supervision and administration	<u>29,000</u>
Total project cost (July 1963)		\$362,000

TABLE T-23
Cost estimate
Meramec River Basin, Missouri - Brady Reservoir (H-5A)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.-	<u>LANDS AND DAMAGES</u>				(\$ 87,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 46,500
.2	<u>U. S. Forest Service</u>				
	Total lands and damages, including contingencies	sum	job		<u>40,500</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 87,000
02.	<u>RELOCATIONS</u>				(\$ 26,000)
.1	<u>Roads</u>				
	Roads	.33 mile		8,000.00	\$ 2,670
	Bridges or culverts	sum	job		<u>20,000</u>
	Subtotal				\$ 22,670
	Contingencies				<u>3,330</u>
	Total for roads				\$ 26,000
	TOTAL FOR RELOCATIONS				\$ 26,000
03.	<u>RESERVOIRS</u>				(\$ 8,000)
	Clearing and grubbing	40	acre	175.00	<u>\$ 7,000</u>
	Subtotal				\$ 7,000
	Contingencies				<u>1,000</u>
	TOTAL FOR RESERVOIRS				\$ 8,000
04.	<u>DAMS</u>				(\$124,000)
	Excavation, common	2,750	cu.yd.	0.45	\$ 1,238
	Excavation, rock		cu.yd.		
	Drilling grout holes	1,700	lin.ft.	4.50	7,650
	Grout	1,700	cu.ft.	5.00	8,500
	Embankment, compacted, impervious	103,000	cu.yd.	0.75	77,250
	Riprap	400	ton	5.00	2,000
	Concrete, reinf.	50	cu.yd.	85.00	4,250
	Steel concrete reinf.	2,400	lb.	0.20	480
	Reinf. concrete pipe, 36" diameter		lin.ft.		

TABLE T-23 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
DAMS (Cont'd)					
	Reinf. concrete pipe, 24" diameter	190	lin.ft.	7.00	\$ 1,330
	Reinf. concrete pipe, 12" diameter	60	lin.ft.	4.00	240
	Hel-Cor metal pipe, 6", perforated	200	lin.ft.	3.50	700
	Hel-Cor metal pipe, 6", non-perforated	250	lin.ft.	3.50	875
	Filter material	350	ton	5.00	1,750
	Trash rack or guardrails	1	ea.	400.00	400
	Mulching, fertilizing and seeding	5	acre	200.00	1,000
	Sluice gates, complete	sum	job		800
	Subtotal				\$108,463
	Contingencies				15,537
	TOTAL FOR DAMS				\$124,000
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 2,000)
	Roads	.125 mile		14,000.00	\$ 1,750
	Subtotal				\$ 1,750
	Contingencies				250
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$ 2,000
14.	<u>RECREATION FACILITIES</u>				(\$ 25,000)
	Picnic tables (PT-2)	10	ea.	55.00	\$ 550
	Picnic tables (PT-1 conc.)	10	ea.	75.00	750
	Concrete Pads	10	ea.	150.00	1,500
	Barbecue braziers	20	ea.	65.00	1,300
	Refuse containers (SR-1)	7	ea.	45.00	315
	Incinerators (SI-2)	1	ea.	300.00	300
	Comfort stations (SC-2 mod.)	1	ea.	6,000.00	6,000
	Prefab launching ramp (BR-2)	sum	job		3,000
	Signs	sum	job		385
	Access roads	.5	mile	8,000.00	4,000
	Parking areas		acre		
	Tent campsites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		2,400
	Subtotal				\$ 21,500
	Contingencies				3,500
	TOTAL FOR RECREATION FACILITIES				\$ 25,000

TABLE T-23 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
19.	<u>BUILDINGS, GROUNDS AND UTILITIES</u>				(\$ 5,000)
	Equipment storage and maintenance building	sum	job		\$ 4,000
	Chain link fencing	200	lin.ft.	2.90	<u>580</u>
	Subtotal				\$ 4,580
	Contingencies				<u>420</u>
	TOTAL FOR BUILDINGS, GROUNDS AND UTILITIES				\$ 5,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 7,000)
	Ground maintenance equipment	sum	job		\$ 1,000
	Shop equipment	sum	job		500
	Miscellaneous equipment	sum	job		<u>4,780</u>
	Subtotal				\$ 6,280
	Contingencies				<u>720</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 7,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 49,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 29,000
	TOTAL PROJECT COST (July 1963)				\$362,000

TABLE T-24
Cost estimate
Meramec River Basin, Missouri - Birch Creek Reservoir (H-6)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	262,000
02	Relocations	11,000
03	Reservoirs	6,000
04	Dams	329,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	8,000
14	Recreation facilities	50,000
19	Buildings, grounds, and utilities	5,000
20	Permanent operating equipment	7,000
30	Engineering and design	105,000
31	Supervision and administration	<u>44,000</u>
	Total project cost (July 1963)	\$830,000

TABLE T-24
Cost estimate
Meramec River Basin, Missouri - Birch Creek Reservoir (H-6)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.	<u>LANDS AND DAMAGES</u>				(\$ 262,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 139,500
.2	<u>U. S. Forest Service</u>				
	Total lands and damages, including contingencies	sum	job		<u>122,500</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 262,000
02.	<u>RELOCATIONS</u>				(\$ 11,000)
.1	<u>Roads</u>				
	Roads	.125	mile	8,000.00	\$ <u>1,000</u>
	Subtotal				\$ 1,000
	Contingencies				<u>150</u>
	Total for roads				\$ 1,150
.3	<u>Cemeteries, Utilities and Structures</u>				
	Cemeteries	sum	job		\$ <u>8,200</u>
	Subtotal				\$ 8,200
	Contingencies				<u>1,650</u>
	Total for cemeteries, utilities and structures				\$ 9,850
	TOTAL FOR RELOCATIONS				\$ 11,000
03.	<u>RESERVOIRS</u>				(\$ 6,000)
	Clearing and grubbing	30	acre	175.00	<u>5,250</u>
	Subtotal				\$ 5,250
	Contingencies				<u>750</u>
	TOTAL FOR RESERVOIRS				\$ 6,000
04.	<u>DAMS</u>				(\$ 329,000)
	Excavation, common	12,800	cu.yd.	0.45	\$ 5,760
	Excavation, rock	21,100	cu.yd.	5.00	105,500
	Drilling grout holes	1,900	lin.ft.	4.50	8,550
	Grout	1,900	cu.ft.	5.00	9,500

TABLE T-24 (Cont'd)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
04.	<u>DAMS</u> (Cont'd)				
	Embankment, compacted impervious	168,000	cu.yd.	0.75	\$ 126,000
	Riprap	1,550	ton	5.00	7,750
	Concrete, reinf.	150	cu.yd.	85.00	12,750
	Steel, concrete reinf.	18,300	lb.	0.20	3,660
	Reinf. concrete pipe, 24" diameter	200	lin.ft.	7.00	1,400
	Reinf. concrete pipe, 12" diameter	60	lin.ft.	4.00	240
	Hel-Cor metal pipe, 6" perforated	500	lin.ft.	3.50	1,750
	Hel-Cor metal pipe, 6", non-perforated	80	lin.ft.	3.50	280
	Filter material	500	ton	5.00	2,500
	Trash rack or guardrails	1	ea.	400.00	400
	Mulching, fertilizing and seeding	4	acre	200.00	800
	Sluice gates, complete	sum	job		800
	Subtotal				\$ 287,640
	Contingencies				41,360
	TOTAL FOR DAMS				\$ 329,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate 30" x 30", 50' head, complete	2	ea	1,250.00	\$ 2,500
	Concrete, reinforced, gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinf.	300	lb.	.15	45
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				355
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 8,000)
	Roads	.5 mile		14,000.00	\$ 7,000
	Subtotal				\$ 7,000
	Contingencies				1,000
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$ 8,000

TABLE T-24 (Cont'd)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
14.	<u>RECREATION FACILITIES</u>				(\$ 50,000)
	Picnic tables (PT-2)	20	ea.	55.00	\$ 1,100
	Picnic tables (PT-1 conc.)	20	ea.	75.00	1,500
	Concrete pads	20	ea.	150.00	3,000
	Barbecue braziers	40	ea.	65.00	2,600
	Refuse containers (SR-1)	14	ea.	45.00	630
	Incinerators (SI-2)	2	ea.	300.00	600
	Comfort stations (SC-2 mod.)	2	ea.	6,000.00	12,000
	Prefab launching ramp (BR-2)	sum	job		6,000
	Signs	sum	job		770
	Access roads	1	mile	8,000.00	8,000
	Parking areas		acre		
	Tent campsites	sum	job		2,000
	Well w/pitcher pumps	sum	job		4,800
	Subtotal				\$ 43,000
	Contingencies				7,000
	TOTAL FOR RECREATION FACILITIES				\$ 50,000
19.	<u>BUILDINGS, GROUNDS AND UTILITIES</u>				(\$ 5,000)
	Equipment storage and main- tenance building	sum	job		\$ 4,000
	Chain link fencing	200	lin.ft.	2.90	580
	Subtotal				\$ 4,580
	Contingencies				420
	TOTAL FOR BUILDINGS, GROUNDS AND UTILITIES				\$ 5,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 7,000)
	Ground maintenance equipment	sum	job		\$ 1,000
	Shop equipment	sum	job		500
	Miscellaneous equipment	sum	job		4,780
	Subtotal				\$ 6,280
	Contingencies				720
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 7,000
30.	<u>ENGINEERING AND DESIGN</u>				\$105,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 44,000
	TOTAL PROJECT COST (July 1963)				\$830,000

TABLE T-25
Cost estimate

Meramec River Basin, Missouri - Little Indian Creek Reservoir (H-8)

Classifi-
cation
No.

Item

Cost

01	Lands and damages	\$ 303,000
02	Relocations	24,000
03	Reservoirs	8,000
04	Dams	409,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	21,000
14	Recreation facilities	50,000
19	Buildings, grounds, and utilities	5,000
20	Permanent operating equipment	7,000
30	Engineering and design	132,000
31	Supervision and administration	<u>58,000</u>
	Total project cost (July 1963)	\$ 1,020,000

TABLE T-25

Cost estimate

Meramec River Basin, Missouri - Little Indian Creek Reservoir (H-8)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$ 303,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 173,000
.2	<u>U. S. Forest Service</u>				
	Total lands and damages, including contingencies	sum	job		<u>130,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 303,000
02.	<u>RELOCATIONS</u>				(\$ 24,000)
.1	<u>Roads</u>				
	Roads	.125	mile	8,000.00	\$ 1,000
	Bridges or culverts	sum	job		<u>20,000</u>
	Subtotal				\$ 21,000
	Contingencies				<u>3,000</u>
	Total for roads				\$ 24,000
	TOTAL FOR RELOCATIONS				\$ 24,000
03.	<u>RESERVOIRS</u>				(\$ 8,000)
	Clearing and grubbing	40	acre	175.00	<u>\$ 7,000</u>
	Subtotal				7,000
	Contingencies				<u>1,000</u>
	TOTAL FOR RESERVOIRS				\$ 8,000
04.	<u>DAMS</u>				(\$ 409,000)
	Excavation, common	4,320	cu.yd.	0.45	\$ 1,944
	Drilling grout holes	4,200	lin.ft.	4.50	18,900
	Grout	4,200	cu.ft.	5.00	21,000
	Embankment, compacted, impervious	360,000	cu.yd.	0.75	270,000
	Riprap	1,630	ton	5.00	8,150
	Concrete, reinf.	230	cu.yd.	100.00	23,000

TABLE T-25 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
04.	<u>DAMS (Cont'd)</u>				
	Steel, concrete reinf.	31,300	lb.	0.20	\$ 6,260
	Reinf. concrete pipe, 24" diameter	300	lin.ft.	7.00	2,100
	Reinf. concrete pipe, 12" diameter	70	lin.ft.	4.00	280
	Hel-Cor metal pipe, 6", perforated	250	lin.ft.	3.50	875
	Hel-Cor metal pipe, 6", non-perforated	130	lin.ft.	3.50	455
	Filter material	350	ton	5.00	1,750
	Trash rack or guardrails	1	ea.	400.00	400
	Mulching, fertilizing and seeding	8	acre	200.00	1,600
	Sluice gates, complete	sum	job		800
	Subtotal				\$ 357,514
	Contingencies				51,486
	TOTAL FOR DAMS				\$ 409,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate 30" x 30", 50' head, complete	2	ea.	1,250.00	\$ 2,500
	Concrete, reinf., gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinf.	300	lb.	.15	45
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				355
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 21,000)
	Roads	1	mile	18,000.00	\$ 18,000
	Subtotal				18,000
	Contingencies				3,000
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$ 21,000
14.	<u>RECREATION FACILITIES</u>				(\$ 50,000)
	Picnic tables (PT-2)	20	ea	55.00	\$ 1,100
	Picnic tables (PT-1 conc.)	20	ea	75.00	1,500

TABLE T-25 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
14.	<u>RECREATION FACILITIES (Cont'd)</u>				
	Concrete pads	20	ea.	150.00	\$ 3,000
	Barbecue braziers	40	ea.	65.00	2,600
	Refuse containers (SR-1)	14	ea.	45.00	630
	Incinerators (SI-2)	2	ea.	300.00	600
	Comfort stations (SC-2 mod.)	2	ea.	6,000.00	12,000
	Prefab launching ramp (BR-2)	sum	job		6,000
	Signs	sum	job		770
	Access roads	1	mile	8,000.00	8,000
	Parking areas		acre		
	Tent campsites	sum	job		2,000
	Wells w/pitcher pumps	sum	job		4,800
	Subtotal				\$ 43,000
	Contingencies				7,000
	TOTAL FOR RECREATION FACILITIES				\$ 50,000
19.	<u>BUILDINGS, GROUNDS AND UTILITIES</u>				
	Equipment storage and main- tenance building	sum	job		\$ 4,000
	Chain link fencing	200	lin.ft.	2.90	580
	Subtotal				\$ 4,580
	Contingencies				420
	TOTAL FOR BUILDINGS, GROUNDS AND UTILITIES				\$ 5,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				
	Ground maintenance equipment	sum	job		\$ 1,000
	Shop equipment	sum	job		500
	Miscellaneous equipment	sum	job		4,780
	Subtotal				\$ 6,280
	Contingencies				720
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 7,000
30.	<u>ENGINEERING AND DESIGN</u>				
					\$ 132,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				
					\$ 58,000
	TOTAL PROJECT COST (July 1963)				\$1,020,000

TABLE T-26
Cost estimate
Meramec River Basin, Missouri - Bates Creek Reservoir (H-9)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 136,000
02	Relocations	9,000
03	Reservoirs	6,000
04	Dams	240,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	21,000
14	Recreation facilities	25,000
19	Buildings, grounds, and utilities	5,000
20	Permanent operating equipment	7,000
30	Engineering and design	79,000
31	Supervision and administration	<u>35,000</u>
Total project cost (July 1963)		\$ 566,000

TABLE T-26
Cost estimate
Meramec River Basin, Missouri - Bates Creek Reservoir (H-9)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$ 136,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages including contingencies	sum	job		\$ 64,000
.2	<u>U. S. Forest Service</u>				
	Total lands and damages including contingencies	sum	job		<u>72,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 136,000
02.	<u>RELOCATIONS</u>				(\$ 9,000)
.1	<u>Roads</u>				
	Roads	1	mile	8,000.00	\$ <u>8,000</u>
	Subtotal				\$ 8,000
	Contingencies				<u>1,000</u>
	Total for roads				\$ 9,000
	TOTAL FOR RELOCATIONS				\$ 9,000
03.	<u>RESERVOIRS</u>				(\$ 6,000)
	Clearing and grubbing	30	acre	175.00	\$ <u>5,250</u>
	Subtotal				\$ 5,250
	Contingencies				<u>750</u>
	TOTAL FOR RESERVOIRS				\$ 6,000
04.	<u>DAMS</u>				(\$ 240,000)
	Excavation, common	2,760	cu.yd.	0.45	\$ 1,242
	Excavation, rock	8,200	cu.yd.	5.00	41,000
	Drilling grout holes	2,700	lin.ft.	4.50	12,150
	Grout	2,700	cu.ft.	5.00	13,500
	Embankment, compacted, impervious	155,000	cu.yd.	0.75	116,250
	Riprap	1,500	ton	5.00	7,500
	Concrete, reinf.	120	cu.yd.	85.00	10,200
	Steel, concrete reinf.	4,710	lb.	0.20	942

TABLE T-26 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
04.	<u>DAMS (Cont'd)</u>				
	Reinf. concrete pipe, 36" diameter	230	lin.ft.	13.00	\$ 2,990
	Reinf. concrete pipe, 12" diameter	90	lin.ft.	4.00	360
	Hel-Cor metal pipe, 6", perforated	150	lin.ft.	3.50	525
	Hel-Cor metal pipe, 6", non-perforated	100	lin.ft.	3.50	350
	Filter material	140	ton	5.00	700
	Trash rack or guardrails	1	ea.	400.00	400
	Mulching, fertilizing and seeding	7	acre	200.00	1,400
	Sluice gates, complete	sum	job		<u>800</u>
	Subtotal				\$ 210,309
	Contingencies				<u>29,691</u>
	TOTAL FOR DAMS				\$ 240,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate 30" x 30", 50' head, complete	2	ea.	1,250.00	\$ 2,500
	Concrete, reinf., gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinf.	300	lb.	.15	<u>45</u>
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				<u>355</u>
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 21,000)
	Roads	1	mile	18,000.00	\$ <u>18,000</u>
	Subtotal				\$ 18,000
	Contingencies				<u>3,000</u>
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$ 21,000

TABLE T-26 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
14.	<u>RECREATION FACILITIES</u>				(\$ 25,000)
	Picnic tables (PT-2)	10	ea.	55.00	\$ 550
	Picnic tables (PT-1 conc.)	10	ea.	75.00	750
	Concrete pads	10	ea.	150.00	1,500
	Barbecue braziers	20	ea.	65.00	1,300
	Refuse containers (SR-1)	7	ea.	45.00	315
	Incinerators (SI-2)	1	ea.	300.00	300
	Comfort stations (SC-2 mod.)	1	ea.	6,000.00	6,000
	Prefab launching ramp (BR-2)	sum	job		3,000
	Signs	sum	job		385
	Access roads	.5	mile	8,000.00	4,000
	Parking areas		acre		
	Tent campsites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		<u>2,400</u>
	Subtotal				\$ 21,500
	Contingencies				<u>3,500</u>
	TOTAL FOR RECREATION FACILITIES				\$ 25,000
19.	<u>BUILDINGS, GROUNDS AND UTILITIES</u>				(\$ 5,000)
	Equipment storage and main- tenance building	sum	job		\$ 4,000
	Chain link fencing	200	lin.ft.	2.90	<u>580</u>
	Subtotal				\$ 4,580
	Contingencies				<u>420</u>
	TOTAL FOR BUILDINGS, GROUNDS AND UTILITIES				\$ 5,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 7,000)
	Ground maintenance equipment	sum	job		\$ 1,000
	Shop equipment	sum	job		500
	Miscellaneous equipment	sum	job		<u>4,780</u>
	Subtotal				\$ 6,280
	Contingencies				<u>720</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 7,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 79,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 35,000
	TOTAL PROJECT COST (July 1963)				\$ 566,000

TABLE T-27
Cost estimate
Meramec River Basin, Missouri - Lost Creek Reservoir (H-10A)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 79,000
02	Relocations	32,000
03	Reservoirs	12,000
04	Dams	201,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	16,000
14	Recreation facilities	25,000
19	Buildings, grounds, and utilities	5,000
20	Permanent operating equipment	7,000
30	Engineering and design	75,000
31	Supervision and administration	<u>33,000</u>
Total project cost (July 1963)		\$ 488,000

TABLE T-27
Cost estimate
Meramec River Basin, Missouri - Lost Creek Reservoir (H-10A)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.-	<u>LANDS AND DAMAGES</u>				(\$ 79,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 42,500
.2	<u>U. S. Forest Service</u>				
	Total lands and damages, including contingencies	sum	job		<u>36,500</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 79,000
02.	<u>RELOCATIONS</u>				(\$ 32,000)
.1	<u>Roads</u>				
	Roads	.125	Mile	8,000.00	\$ 1,000
	Bridges or culverts	sum	job		<u>20,000</u>
	Subtotal				\$ 21,000
	Contingencies				<u>3,000</u>
	Total for roads				\$ 24,000
.3	<u>Cemeteries, utilities and structures</u>				
	Utilities	sum	job		<u>\$ 7,000</u>
	Subtotal				\$ 7,000
	Contingencies				<u>1,000</u>
	Total for cemeteries, utilities and structures				\$ 8,000
	TOTAL FOR RELOCATIONS				\$ 32,000
03.	<u>RESERVOIRS</u>				(\$ 12,000)
	Clearing and grubbing	60	acre	175.00	<u>\$ 10,500</u>
	Subtotal				\$ 10,500
	Contingencies				<u>1,500</u>
	TOTAL FOR RESERVOIRS				\$ 12,000

TABLE T-27 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
04.	<u>DAMS</u>				(\$ 201,000)
	Excavation, common	4,940	cu.yd.	0.45	\$ 2,223
	Drilling grout holes	1,600	lin.ft.	4.50	7,200
	Grout	1,600	cu.ft.	5.00	8,000
	Embankment, compacted impervious	138,000	cu.yd.	0.75	103,500
	Riprap	1,220	ton	5.00	6,100
	Concrete, reinforced	380	cu.yd.	95.00	36,100
	Steel, concrete reinforcing	41,500	lb.	0.20	8,300
	Reinforced concrete pipe, 24" diameter	210	lin.ft.	7.00	1,470
	Reinforced concrete pipe, 12" diameter	90	lin.ft.	4.00	360
	Hel-Cor metal pipe, 6", perforated	150	lin.ft.	3.50	525
	Hel-Cor metal pipe, 6", non-perforated	100	lin.ft.	3.50	350
	Filter material	140	ton	5.00	700
	Trash rack or guardrails	1	each	400.00	400
	Mulching, fertilizing, and seeding	3	acre	200.00	600
	Sluice gates, complete	sum	job		800
	Subtotal				\$ 176,628
	Contingencies				24,372
	TOTAL FOR DAMS				\$ 201,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate, 30"x30", 50' head, complete	2	each	1,250.00	\$ 2,500
	Concrete, reinforced, gate structure	2	cu. yd.	50.00	100
	Steel, concrete reinforcing	300	lb.	.15	45
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				355
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000

TABLE T-27 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
08.	<u>ROADS, RAILROADS, AND BRIDGES</u>				(\$ 16,000)
	Roads	1	mile	14,000.00	<u>14,000</u>
	Subtotal				\$ 14,000
	Contingencies				<u>2,000</u>
	TOTAL FOR ROADS, RAILROADS, AND BRIDGES				\$ 16,000
14.	<u>RECREATION FACILITIES</u>				(\$ 25,000)
	Picnic tables (PT-2)	10	each	55.00	\$ 550
	Picnic tables (PT-1 concrete)	10	each	75.00	\$ 750
	Concrete pads	10	each	150.00	1,500
	Barbecue braziers	20	each	65.00	1,300
	Refuse containers (SR-1)	7	each	45.00	315
	Incinerators (SI-2)	1	each	300.00	300
	Comfort stations (SC-2 mod.)	1	each	6,000.00	6,000
	Prefab launching ramp (BR-2)	sum	job		3,000
	Signs	sum	job		385
	Access roads	.5	mile	8,000.00	4,000
	Parking areas		acre		
	Tent campsites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		<u>2,400</u>
	Subtotal				\$ 21,500
	Contingencies				<u>3,500</u>
	TOTAL FOR RECREATION FACILITIES				\$ 25,000
19.	<u>BUILDINGS, GROUNDS, AND UTILITIES</u>				(\$ 5,000)
	Equipment, storage and maintenance bldg.	sum	job		\$ 4,000
	Chain link fencing	200	lin.ft.	2.90	<u>580</u>
	Subtotal				\$ 4,580
	Contingencies				<u>420</u>
	TOTAL FOR BUILDINGS, GROUNDS, AND UTILITIES				\$ 5,000

TABLE T-27 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 7,000)
	Ground maintenance equipment	sum	job		\$ 1,000
	Shop equipment	sum	job		500
	Miscellaneous equipment	sum	job		<u>4,780</u>
	Subtotal				\$ 6,280
	Contingencies				<u>720</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 7,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 75,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 33,000
	TOTAL PROJECT COST (July 1963)				\$ 488,000

TABLE T-28
Cost estimate
Meramec River Basin, Missouri - Winsell Creek Reservoir (H-11A)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 190,000
02	Relocations	7,000
03	Reservoirs	4,000
04	Dams	79,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	4,000
14	Recreation facilities	25,000
19	Buildings, grounds, and utilities	5,000
20	Permanent operating equipment	7,000
30	Engineering and design	34,000
31	Supervision and administration	<u>21,000</u>
Total project cost (July 1963)		\$ 379,000

TABLE T-28
Cost estimate
Meramec River Basin, Missouri - Winsell Creek Reservoir (H-11A)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$ 190,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 108,000
.2	<u>U. S. Forest Service</u>				
	Total lands and damages, including contingencies	sum	job		<u>82,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 190,000
02.	<u>RELOCATIONS</u>				(\$ 7,000)
.1	<u>Roads</u>				
	Roads	.125 mile		8,000.00	\$ 1,000
	Bridges or culverts	sum	job		<u>4,700</u>
	Subtotal				\$ 5,700
	Contingencies				<u>1,300</u>
	Total for roads				\$ 7,000
	TOTAL FOR RELOCATIONS				\$ 7,000
03.	<u>RESERVOIRS</u>				(\$ 4,000)
	Clearing and grubbing	20	acre	175.00	<u>\$ 3,500</u>
	Subtotal				\$ 3,500
	Contingencies				<u>500</u>
	TOTAL FOR RESERVOIRS				\$ 4,000

TABLE T-28 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
04.	<u>DAMS</u>				(\$ 79,000)
	Excavation, common	2,640	cu.yd.	0.45	\$ 1,188
	Excavation, rock	800	cu.yd.	5.00	4,000
	Drilling grout holes	1,600	lin.ft.	4.50	7,200
	Grout	1,600	cu.ft.	5.00	8,000
	Embankment, compacted, impervious	29,000	cu.yd.	0.75	21,750
	Riprap	800	ton	5.00	4,000
	Concrete, reinforced	150	cu.yd.	85.00	12,750
	Steel, concrete reinforcing	17,000	lbs.	0.20	3,400
	Reinforced concrete pipe, 24" diameter	230	lin.ft.	7.00	1,610
	Reinforced concrete pipe, 12" diameter	60	lin.ft.	4.00	240
	Hel-Cor metal pipe, 6", perforated	300	lin.ft.	3.50	1,050
	Hel-Cor metal pipe, 6", non-perforated	100	lin.ft.	3.50	350
	Filter Material	380	ton	5.00	1,900
	Trash rack or guardrails	1	each	400.00	400
	Mulching, fertilizing and seeding	5	acre	200.00	1,000
	Sluice gates, complete	sum	job		800
	Subtotal				\$ 69,638
	Contingencies				9,362
	TOTAL FOR DAMS				\$ 79,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate 30"x30", 50' head, complete	2	each	1,250.00	\$ 2,500
	Concrete, reinforcing gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinforcing	300	lb.	.15	45
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				355
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000

TABLE T-28 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 4,000)
	Roads	.25 mile		14,000.00	\$ 3,500
	Subtotal				\$ 3,500
	Contingencies				500
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$ 4,000
14.	<u>RECREATION FACILITIES</u>				(\$ 25,000)
	Picnic tables (PT-2)	10	each	55.00	\$ 550
	Picnic tables (PT-1 concrete)	10	each	75.00	750
	Concrete pads	10	each	150.00	1,500
	Barbecue braziers	20	each	65.00	1,300
	Refuse containers (SR-1)	7	each	45.00	315
	Incinerators (SI-2)	1	each	300.00	300
	Comfort stations (SC-2 mod.)	1	each	6,000.00	6,000
	Prefab launching ramp (BR-2)	sum	job		3,000
	Signs	sum	job		385
	Access roads	.5	mile	8,000.00	4,000
	Parking areas		acre		
	Tent campsites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		2,400
	Subtotal				\$ 21,500
	Contingencies				3,500
	TOTAL FOR RECREATION FACILITIES				\$ 25,000
19.	<u>BUILDINGS, GROUNDS AND UTILITIES</u>				(\$ 5,000)
	Equipment, storage and maintenance bldg.	sum	job		\$ 4,000
	Chain link fencing	200	lin.ft.	2.90	580
	Subtotal				\$ 4,580
	Contingencies				420
	TOTAL FOR BUILDINGS, GROUNDS AND UTILITIES				\$ 5,000

TABLE T-28 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 7,000)
	Ground maintenance equipment	sum	job	\$	1,000
	Shop equipment	sum	job		500
	Miscellaneous equipment	sum	job		<u>4,780</u>
	Subtotal			\$	6,280
	Contingencies				<u>720</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT			\$	7,000
30.	<u>ENGINEERING AND DESIGN</u>			\$	34,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>			\$	21,000
	TOTAL PROJECT COST (July 1963)			\$	379,000

TABLE T-29
Cost estimate
Meramec River Basin, Missouri - Boone Creek Reservoir (H-13A)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 289,000
02	Relocations	4,000
03	Reservoirs	14,000
04	Dams	288,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	2,000
14	Recreation facilities	25,000
19	Buildings, grounds, and utilities	5,000
20	Permanent operating equipment	7,000
30	Engineering and design	87,000
31	Supervision and administration	<u>37,000</u>
Total project cost (July 1963)		\$ 761,000

TABLE T-29
Cost estimate
Meramec River Basin, Missouri - Boone Creek Reservoir (H-13A)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$ 289,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 197,000
.2	<u>U. S. Forest Service</u>				
	Total lands and damages, including contingencies	sum	job		<u>92,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 289,000
02.	<u>RELOCATIONS</u>				(\$ 4,000)
.1	<u>Roads</u>				
	Roads	125 mile		8,000.00	\$ 1,000
	Bridges or culverts	sum	job		<u>2,100</u>
	Subtotal				\$ 3,100
	Contingencies				<u>900</u>
	Total for roads				\$ 4,000
	TOTAL FOR RELOCATIONS				\$ 4,000
03.	<u>RESERVOIRS</u>				(\$ 14,000)
	Clearing and grubbing	70	acre	175.00	<u>\$ 12,250</u>
	Subtotal				\$ 12,250
	Contingencies				<u>1,750</u>
	TOTAL FOR RESERVOIRS				\$ 14,000

(b'Cont'd) 29
TABLE T-29 (Cont'd)

Classification No.	Item	Quantity	Unit	Unit price	Total estimated cost
04.	DAMS				(\$ 288,000)
	Excavation, common	22,700	cu.yd.	0.45	\$ 10,215
	Drilling grout holes	2,100	lin.ft.	4.50	9,450
	Grout	2,100	cu.ft.	5.00	10,500
	Embankment, compacted, impervious	240,000	cu.yd.	0.75	180,000
	Riprap	1,180	ton	5.00	5,900
	Concrete, reinforced	250	cu.yd.	85.00	21,250
	Steel, concrete reinforcing	34,400	lb.	0.20	6,880
	Reinforced concrete pipe, 24" diameter	200	lin.ft.	7.00	1,400
	Reinforced concrete pipe, 12" diameter	70	lin.ft.	4.00	280
	Hel-Cor metal pipe, 6", perforated	250	lin.ft.	3.50	875
	Hel-Cor metal pipe, 6", non-perforated	60	lin.ft.	3.50	210
	Filter material	320	ton	5.00	1,600
	Trash rack or guardrails	1	each	400.00	400
	Mulching, fertilizing and seeding	8	acre	200.00	1,600
	Sluice gates, complete	sum	job		800
	Subtotal				\$ 251,360
	Contingencies				36,640
	TOTAL FOR DAMS				\$ 288,000
06.	FISH AND WILDLIFE FACILITIES				(\$ 3,000)
	Sluice gate 30"x30", 50' head, complete	2	each	1,250.00	\$ 2,500
	Concrete, reinforced, gate structure	2	cu.yd.	50.00	100
	Steel, concrete, reinforcing	300	lb.	.15	45
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				355
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000

TABLE T-29 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 2,000)
	Roads	.125 mile		14,000.00	\$ 1,750
	Subtotal				\$ 1,750
	Contingencies				250
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$ 2,000
14.	<u>RECREATION FACILITIES</u>				(\$ 25,000)
	Picnic tables (PT-2)	10	each	55.00	\$ 550
	Picnic tables (PT-1 concrete	10	each	75.00	750
	Concrete pads	10	each	150.00	1,500
	Barbecue braziers	20	each	65.00	1,300
	Refuse containers (SR-1)	7	each	45.00	315
	Incinerators (SI-2)	1	each	300.00	300
	Comfort stations (SC-2 mod.)	1	each	6,000.00	6,000
	Prefab launching ramp (BR-2)	sum	job		3,000
	Signs	sum	job		385
	Access roads	.5	mile	8,000.00	4,000
	Parking areas		acre		
	Tent campsites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		2,400
	Subtotal				\$ 21,500
	Contingencies				3,500
	TOTAL FOR RECREATION FACILITIES				\$ 25,000
19.	<u>BUILDINGS, GROUNDS AND UTILITIES</u>				(\$ 5,000)
	Equipment storage and maintenance bldg.	sum	job		\$ 4,000
	Chain link fencing	200	lin.ft.	2.90	580
	Subtotal				\$ 4,580
	Contingencies				420
	TOTAL FOR BUILDINGS, GROUNDS AND UTILITIES				\$ 5,000

TABLE T-29 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 7,000)
	Ground maintenance equipment	sum	job		\$ 1,000
	Shop equipment	sum	job		500
	Miscellaneous equipment	sum	job		<u>4,780</u>
	Subtotal				\$ 6,280
	Contingencies				<u>720</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 7,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 87,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 37,000
	TOTAL PROJECT COST (July 1963)				\$ 761,000

TABLE T-30
Cost estimate
Meramec River Basin, Missouri - Big River Reservoir (H-25)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$ 162,000
02	Relocations	21,000
03	Reservoirs	8,000
04	Dams	209,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	23,000
14	Recreation facilities	25,000
19	Buildings, grounds, and utilities	5,000
20	Permanent operating equipment	7,000
30	Engineering and design	75,000
31	Supervision and administration	<u>33,000</u>
Total project cost (July 1963)		\$ 571,000

TABLE T-30
Cost estimate
Meramec River Basin, Missouri - Big River Reservoir (H-25)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$ 162,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 71,500
.2	<u>U. S. Forest Service</u>				
	Total lands and damages, including contingencies	sum	job		<u>90,500</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 162,000
02.	<u>RELOCATIONS</u>				(\$ 21,000)
.1	<u>Roads</u>				
	Roads	.2	mile	8,000.00	\$ 16,000
	Bridges or culverts	sum	job		<u>1,880</u>
	Subtotal				\$ 17,880
	Contingencies				<u>3,120</u>
	Total for roads				\$ 21,000
	TOTAL FOR RELOCATIONS				\$ 21,000
03.	<u>RESERVOIRS</u>				(\$ 8,000)
	Clearing and grubbing	40	acre	175.00	<u>\$ 7,000</u>
	Subtotal				\$ 7,000
	Contingencies				<u>1,000</u>
	TOTAL FOR RESERVOIRS				\$ 8,000

TABLE T-30 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
04.	<u>DAMS</u>				(\$ 209,000)
	Excavation, rock	30	cu.yd.	10.00	\$ 300
	Drilling grout holes	1,500	lin.ft.	4.50	6,750
	Grout	1,500	cu.ft.	5.00	7,500
	Embankment, compacted, impervious	79,600	cu.yd.	0.75	59,700
	Riprap	350	ton	5.00	1,750
	Concrete, reinforced	700	cu.yd.	120.00	84,000
	Steel, concrete reinforcing	93,000	lb.	0.20	18,600
	Reinforced concrete pipe, 24" diameter	350	lin.ft.	7.00	2,450
	Reinforced concrete pipe, 12" diameter	70	lin.ft.	4.00	280
	Hel-Cor metal pipe, 6", perforated	150	lin.ft.	3.50	525
	Hel-Cor metal pipe, 6", non-perforated	100	lin.ft.	3.50	350
	Filter material	140	ton	5.00	700
	Trash rack or guardrails	1	each	400.00	400
	Sluice gates, complete	sum	job		800
	Subtotal				\$ 184,105
	Contingencies				24,895
	TOTAL FOR DAMS				\$ 209,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate 30"x30", 50' head, complete	2	each	1,250.00	\$ 2,500
	Concrete, reinforced, gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinforcing	300	lb.	.15	45
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				355
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000

TABLE T-30 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 23,000)
	Roads	1.125	mile	18,000.00	\$ 20,250
	Subtotal				\$ 20,250
	Contingencies				2,750
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$ 23,000
14.	<u>RECREATION FACILITIES</u>				(\$ 25,000)
	Picnic tables (PT-2)	10	each	55.00	\$ 550
	Picnic tables (PT-1 concrete)	10	each	75.00	750
	Concrete pads	10	each	150.00	1,500
	Barbecue braziers	20	each	65.00	1,300
	Refuse containers (SR-1)	7	each	45.00	315
	Incinerators (SI-2)	1	each	300.00	300
	Comfort stations (SC-2 mod.)	1	each	6,000.00	6,000
	Prefab launching ramp (BR-2)	sum	job		3,000
	Signs	sum	job		385
	Access roads	.5	mile	8,000.00	4,000
	Parking areas		acre		
	Tent campsites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		2,400
	Subtotal				\$ 21,500
	Contingencies				3,500
	TOTAL FOR RECREATION FACILITIES				\$ 25,000
19.	<u>BUILDINGS, GROUNDS AND UTILITIES</u>				(\$ 5,000)
	Equipment storage and maintenance bldg.	sum	job		\$ 4,000
	Chain link fencing	200	lin.ft.	2.90	580
	Subtotal				\$ 4,580
	Contingencies				420
	TOTAL FOR BUILDINGS, GROUNDS AND UTILITIES				\$ 5,000

TABLE T-30 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 7,000)
	Ground maintenance equipment	sum	job	\$	1,000
	Shop equipment	sum	job		500
	Miscellaneous equipment	sum	job		<u>4,780</u>
	Subtotal			\$	6,280
	Contingencies				<u>720</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT			\$	7,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 75,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 33,000
	TOTAL PROJECT COST (July 1963)				\$ 571,000

TABLE T-31
Cost estimate
Meramec River Basin, Missouri - Dry Fork Creek Reservoir (H-31)

<u>Classi- fication No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$116,000
02	Relocations	30,000
03	Reservoirs	2,000
04	Dams	216,000
06	Fish and wildlife facilities	3,000
08	Roads, railroads, and bridges	16,000
14	Recreation facilities	25,000
19	Buildings, grounds, and utilities	5,000
20	Permanent operating equipment	7,000
30	Engineering and design	76,000
31	Supervision and administration	<u>34,000</u>
Total project cost (July 1963)		\$530,000

TABLE T-31
Cost estimate
Meramec River Basin, Missouri - Dry Fork Creek Reservoir (H-31)

Classi- fication No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.	<u>LANDS AND DAMAGES</u>				(\$ 116,000)
.1	<u>Corps of Engineers</u>				
	Total lands and damages, including contingencies	sum	job		\$ 76,000
.2	<u>U. S. Forest Service</u>				
	Total lands and damages, including contingencies	sum	job		<u>40,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 116,000
02.	<u>RELOCATIONS</u>				(\$ 30,000)
.1	<u>Roads</u>				
	Roads	0.75	mile	8,000.00	\$ 6,000
	Bridges or culverts	sum	job		<u>20,000</u>
	Subtotal				\$ 26,000
	Contingencies				<u>4,000</u>
	Total for roads				\$ 30,000
	TOTAL FOR RELOCATIONS				\$ 30,000
03.	<u>RESERVOIRS</u>				(\$ 2,000)
	Clearing and grubbing	10	acre	175.00	<u>\$ 1,750</u>
	Subtotal				\$ 1,750
	Contingencies				<u>250</u>
	TOTAL FOR RESERVOIRS				\$ 2,000

TABLE T-31 (Cont'd)

<u>Classi- fication No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
04.	<u>DAMS</u>				(\$ 216,000)
	Excavation, common	6,540	cu.yd.	0.45	\$ 2,943
	Drilling grout holes	2,600	lin.ft.	4.50	11,700
	Grout	2,600	cu.ft.	5.00	13,000
	Embankment, compacted, impervious	171,000	cu.yd.	0.75	128,250
	Riprap	2,670	ton	5.00	13,350
	Concrete, reinforced	80	cu.yd.	95.00	7,600
	Steel, concrete reinforcing	5,680	lb.	0.20	1,136
	Reinforced concrete pipe, 36" diameter	200	lin.ft.	13.00	2,600
	Reinforced concrete pipe, 12" diameter	70	lin.ft.	4.00	280
	Hel-Cor metal pipe, 6" perforated	500	lin.ft.	3.50	1,750
	Hel-Cor metal pipe, 6" non-perforated	450	lin.ft.	3.50	1,575
	Filter material	600	ton	5.00	3,000
	Trash rack or guardrails	1	each	400.00	400
	Mulching, fertilizing and seeding	7	acre	200.00	1,400
	Sluice gates, complete	sum	job		800
	Subtotal				\$ 189,784
	Contingencies				26,216
	TOTAL FOR DAMS				\$ 216,000
06.	<u>FISH AND WILDLIFE FACILITIES</u>				(\$ 3,000)
	Sluice gate 30"x30", 50' head, complete	2	each	1,250.00	\$ 2,500
	Concrete, reinforced, gate structure	2	cu.yd.	50.00	100
	Steel, concrete reinforcing	300	lb.	0.15	45
	Subtotal for fish and wildlife facilities				\$ 2,645
	Contingencies				355
	TOTAL FOR FISH AND WILDLIFE FACILITIES				\$ 3,000
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 16,000)
	Roads	1	mile	14,000.00	\$ 14,000
	Subtotal				\$ 14,000
	Contingencies				2,000
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$ 16,000

TABLE T-31 (Cont'd)

Classi- fication No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
14.	<u>RECREATION FACILITIES</u>				(\$ 25,000)
	Picnic tables (PT-2)	10	each	55.00	550
	Picnic tables (PT-1 conc.)	10	each	75.00	750
	Concrete pads	10	each	150.00	1,500
	Barbecue braziers	20	each	65.00	1,300
	Refuse containers (SR-1)	7	each	45.00	315
	Incinerators (SI-2)	1	each	300.00	300
	Comfort stations (SC-2 mod.)	1	each	6,000.00	6,000
	Prefab launching ramp (BR-2)	sum	job		3,000
	Signs	sum	job		385
	Access roads	0.5	mile	8,000.00	4,000
	Parking areas		acre		
	Tent campsites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		2,400
	Subtotal				\$ 21,500
	Contingencies				3,500
	TOTAL FOR RECREATION FACILITIES				\$ 25,000
19.	<u>BUILDINGS, GROUNDS AND UTILITIES</u>				(\$ 5,000)
	Equipment storage and maintenance building	sum	job		\$ 4,000
	Chain link fencing	200	lin.ft.	2.90	580
	Subtotal				\$ 4,580
	Contingencies				420
	TOTAL FOR BUILDINGS, GROUNDS AND UTILITIES				\$ 5,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 7,000)
	Ground maintenance equipment	sum	job		\$ 1,000
	Shop equipment	sum	job		500
	Miscellaneous equipment	sum	job		4,780
	Subtotal				\$ 6,280
	Contingencies				720
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 7,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 76,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 34,000
	TOTAL PROJECT COST (July 1963)				\$ 530,000

TABLE T-32
Cost estimate
Meramec River Basin, Missouri - Coonville Creek Reservoir (H-40)

<u>Classi- fication No.</u>	<u>Item</u>	<u>Cost</u>
01	Lands and damages	\$138,000
03	Reservoirs	8,000
04	Dams	203,000
08	Roads, railroads, and bridges	21,000
14	Recreation facilities	25,000
19	Buildings, grounds, and utilities	5,000
20	Permanent operating equipment	7,000
30	Engineering and design	67,000
31	Supervision and administration	<u>30,000</u>
	Total project cost (July 1963)	\$504,000

TABLE T-32
Cost estimate
Meramec River Basin, Missouri - Coonville Creek Reservoir (H-40)

<u>Classi- fication No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$ 138,000)
.1	<u>Corps of Engineers</u>				
-	Total lands and damages, including contingencies	sum	job		\$ 29,000
.2	<u>U. S. Forest Service</u>				
	Total lands and damages, including contingencies	sum	job		<u>109,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 138,000
03.	<u>RESERVOIRS</u>				(\$ 8,000)
	Clearing and grubbing	40	acre	175.00	\$ 7,000
	Subtotal				7,000
	Contingencies				<u>1,000</u>
	TOTAL FOR RESERVOIRS				\$ 8,000
04.	<u>DAMS</u>				(\$ 203,000)
	Excavation, common	2,130	cu.yd.	0.45	\$ 959
	Excavation, rock	240	cu.yd.	5.00	1,200
	Drilling grout holes	1,500	lin.ft.	4.50	6,750
	Grout	1,500	cu.ft.	5.00	7,500
	Embankment, compacted, impervious	144,000	cu.yd.	0.75	108,000
	Fill, rock	130	ton	5.00	650
	Riprap	1,080	ton	5.00	5,400
	Concrete, reinforced	390	cu.yd.	85.00	33,150
	Steel, concrete reinforcing	38,600	lb.	0.20	7,720
	Reinforced concrete pipe, 12" diameter	300	lin.ft.	4.00	1,200
	Hel-Cor metal pipe, 6" perforated	150	lin.ft.	3.50	525
	Hel-Cor metal pipe, 6", non-perforated	100	lin.ft.	3.50	350
	Filter material	200	ton	5.00	1,000
	Mulching, fertilizing and seeding	3	acre	200.00	600
	Waterway improvement	750	lin.ft.	2.00	1,500
	Sluice gates, complete	sum	job		<u>800</u>
	Subtotal				\$ 177,304
	Contingencies				<u>25,696</u>
	TOTAL FOR DAMS				\$ 203,000

TABLE T-32 (Cont'd)

<u>Classi- fication No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
08.	<u>ROADS, RAILROADS AND BRIDGES</u>				(\$ 21,000)
	Roads	1	mile	18,000.00	\$ 18,000
	Subtotal				\$ 18,000
	Contingencies				<u>3,000</u>
	TOTAL FOR ROADS, RAILROADS AND BRIDGES				\$ 21,000
14.	<u>RECREATION FACILITIES</u>				(\$ 25,000)
	Picnic tables (PT-2)	10	each	55.00	\$ 550
	Picnic tables (PT-1 conc.)	10	each	75.00	750
	Concrete pads	10	each	150.00	1,500
	Barbecue braziers	20	each	65.00	1,300
	Refuse containers (SR-1)	7	each	45.00	315
	Incinerators (SI-2)	1	each	300.00	300
	Comfort stations (SC-2 mod.)	1	each	6,000.00	6,000
	Prefab launching ramp (BR-2)	sum	job		3,000
	Signs	sum	job		385
	Access roads	0.5	mile	8,000.00	4,000
	Parking areas		acre		
	Tent campsites	sum	job		1,000
	Wells w/pitcher pumps	sum	job		<u>2,400</u>
	Subtotal				\$ 21,500
	Contingencies				<u>3,500</u>
	TOTAL FOR RECREATION FACILITIES				\$ 25,000
19.	<u>BUILDINGS, GROUNDS AND UTILITIES</u>				(\$ 5,000)
	Equipment storage and maintenance building	sum	job		\$ 4,000
	Chain link fencing	200	lin.ft.	2.90	<u>580</u>
	Subtotal				\$ 4,580
	Contingencies				<u>420</u>
	TOTAL FOR BUILDINGS, GROUNDS AND UTILITIES				\$ 5,000
20.	<u>PERMANENT OPERATING EQUIPMENT</u>				(\$ 7,000)
	Ground maintenance equipment	sum	job		\$ 1,000
	Shop equipment	sum	job		500
	Miscellaneous equipment	sum	job		<u>4,780</u>
	Subtotal				\$ 6,280
	Contingencies				<u>720</u>
	TOTAL FOR PERMANENT OPERATING EQUIPMENT				\$ 7,000

TABLE T-32 (Cont'd)

<u>Classi- fication No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
30.	<u>ENGINEERING AND DESIGN</u>				\$ 67,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 30,000
-	TOTAL PROJECT COST (July 1963)				\$ 504,000

COST ESTIMATE - LOCAL PROTECTION PROJECTS

**MERAMEC RIVER BASIN,
MISSOURI**

TABLE T-33
Meramec River, Missouri
Comprehensive Basin Study
Cost summary - local protection

Levee area No.	01. Lands and damages	02. Relocations	11. Levees and floodwalls	13. Pumping plants	30. Engineering and design	31. Supervision & administration	Total
2	Federal costs Non-federal costs Total project cost	19,000 19,000	980,000 11,000 991,000	900,000 900,000	240,000 4,000 244,000	160,000 3,000 163,000	2,280,000 237,000 2,517,000
4	Federal costs Non-federal costs Total project cost	86,000 86,000	699,000 7,000 706,000	1,239,000 1,239,000	248,000 12,000 260,000	164,000 8,000 172,000	2,350,000 378,000 2,728,000
5	Federal costs Non-federal costs Total project cost	34,000 34,000	1,528,000 10,000 1,538,000	1,142,000 1,142,000	339,000 5,000 344,000	221,000 4,000 225,000	3,230,000 339,000 3,569,000
7	Federal costs Non-federal costs Total project cost	674,000 674,000	402,000 402,000	602,000 602,000	128,000 128,000	88,000 88,000	1,220,000 674,000 1,894,000
8	Federal costs Non-federal costs Total project cost	68,000 68,000	203,000 2,000 205,000	373,000 373,000	73,000 9,000 82,000	49,000 6,000 55,000	698,000 193,000 891,000
9	Federal costs Non-federal costs Total project cost	41,000 41,000	337,000 4,000 341,000	844,000 844,000	151,000 6,000 157,000	98,000 4,000 102,000	1,430,000 220,000 1,650,000
11	Federal costs Non-federal costs Total project cost		723,000 4,000 727,000	393,000 393,000	141,000 1,000 142,000	93,000 2,000 95,000	1,350,000 289,000 1,639,000
12	Federal costs Non-federal costs Total project cost	284,000 143,000 427,000	741,000 4,000 745,000	559,000 559,000	200,000 23,000 223,000	126,000 12,000 138,000	1,910,000 383,000 2,293,000
17	Federal costs Non-federal costs Total project cost	129,000 129,000	289,000 5,000 294,000	781,000 781,000	137,000 17,000 154,000	93,000 10,000 103,000	1,300,000 207,000 1,507,000

TABLE T-34
Cost estimate
Meramec River Basin, Missouri - Levee Area No. 2

<u>Classi- fication No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>FEDERAL COSTS</u>					
11.	<u>LEVEES AND FLOODWALLS</u>				(\$ 980,000)
	Clearing, levee	45	acre	175.00	\$ 7,875
	Clearing, borrow pit	79	acre	175.00	13,825
	Embankment	680,000	cu.yd.	0.75	510,000
	Seeding and mulching	34	acre	200.00	6,800
	Revetment, riverbank	37,000	ton	5.00	185,000
	Grading, riverbank	39,100	cu.yd.	0.30	11,730
	Road surfacing	3,310	ton	4.00	13,240
	Closure structure, highway 5.5'x36'	sum	job		33,800
	<u>NORTH</u>				
	Ponding area excavation	18,500	cu.yd.	0.75	13,875
	<u>SOUTH</u>				
	Ponding area excavation	16,000	cu.yd.	0.75	12,000
	Subtotal				\$ 824,145
	Contingencies				120,855
	Subtotal for levees and floodwalls				\$ 945,000
	Operation and maintenance during construction, including contingencies				35,000
	TOTAL FOR LEVEES AND FLOODWALLS				\$ 980,000
13.	<u>PUMPING PLANTS</u>				(\$ 900,000)
	North pump station	432	c.f.s.	1,230.00	\$ 531,360
	South pump station	120	c.f.s.	2,040.00	244,800
	Subtotal				\$ 776,160
	Contingencies				117,840
	Subtotal for pumping plants				\$ 894,000
	Operation and maintenance during construction, including contingencies				6,000
	TOTAL FOR PUMPING PLANTS				\$ 900,000

TABLE T-34 (Cont'd)

<u>Classi- fication No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
30.	<u>ENGINEERING AND DESIGN</u>				\$ 240,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 160,000
	TOTAL FEDERAL COSTS				\$2,280,000
	<u>NON-FEDERAL COSTS</u>				
01.	<u>LANDS AND DAMAGES</u>				(\$ 200,000)
	Levee right-of-way	45	acre	800.00	\$ 36,000
	Borrow pit right-of-way	sum	job		102,000
	Ponding area right-of-way	5	acre	800.00	4,000
	Clubhouses	12	each	3,000.00	<u>36,000</u>
	Subtotal for lands and damages				\$ 178,000
	Contingencies				<u>22,000</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 200,000
02.	<u>RELOCATIONS</u>				(\$ 19,000)
.1	<u>Roads</u>				
	Road, crushed stone 0.5 mile	sum	job		\$ 12,000
	Subtotal for roads				\$ 12,000
	Contingencies				<u>2,100</u>
	Subtotal for roads, exclusive of right-of-way				\$ 14,100
	Right-of-way costs for roads, including contingencies				<u>3,900</u>
	Total for roads				\$ 18,000
	Operation and maintenance during construction, including contingencies				<u>1,000</u>
	TOTAL FOR RELOCATIONS				\$ 19,000

TABLE T-34 (Cont'd)

<u>Classi- fication No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
11.	<u>LEVEES AND FLOODWALLS</u>				(\$ 11,000)
	<u>NORTH</u>				
	Excavation, ditch	7,500	cu.yd.	0.75	\$ 5,625
	<u>SOUTH</u>				
	Excavation, ditch	5,000	cu.yd.	0.75	<u>3,750</u>
	Subtotal				\$ 9,375
	Contingencies				<u>1,625</u>
	TOTAL FOR LEVEES AND FLOODWALLS				\$ 11,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 4,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 3,000
	TOTAL NON-FEDERAL COSTS				\$ 237,000
	TOTAL PROJECT COSTS (July 1963)				\$2,517,000

TABLE T-35
Cost estimate
Meramec River Basin, Missouri - Levee Area No. 4

<u>Classi- fication No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>FEDERAL COSTS</u>					
11.	<u>LEVEES AND FLOODWALLS</u>				(\$ 699,000)
	Clearing, levee	49	acre	175.00	\$ 8,575
	Clearing, borrow pit	45	acre	175.00	7,875
	Embankment	576,000	cu.yd.	0.75	432,000
	Seeding and mulching	34	acre	200.00	6,800
	Road surfacing	4,180	ton	4.00	16,720
	Relief wells	4	each	2,000.00	8,000
	Closure structure, R.R. 3'x20'	sum	job		21,750
	Floodwall, reinforced concrete	sum	job		30,000
	<u>SOUTH</u>				
	Ponding area excavation	75,000	cu.yd.	0.75	<u>56,250</u>
	Subtotal				\$ 587,970
	Contingencies				<u>88,030</u>
	Subtotal for levees and floodwalls				\$ 676,000
	Operation and maintenance during construction, including contingencies				<u>23,000</u>
	TOTAL FOR LEVEES AND FLOODWALLS				\$ 699,000
13.	<u>PUMPING PLANTS</u>				(\$1,239,000)
	North pump station	205	c.f.s.	1,620.00	\$ 332,100
	South pump station	696	c.f.s.	1,060.00	<u>737,760</u>
	Subtotal				\$1,069,860
	Contingencies				<u>161,140</u>
	Subtotal for pumping plants				\$1,231,000
	Operation and maintenance during construction, including contingencies				<u>8,000</u>
	TOTAL FOR PUMPING PLANTS				\$1,239,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 248,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 164,000
	TOTAL FEDERAL COSTS				\$2,350,000

TABLE T-35 (Cont'd)

Classi- fication No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
<u>NON-FEDERAL COSTS</u>					
01.	<u>LANDS AND DAMAGES</u>				(\$ 265,000)
	Levee right-of-way	49	acre	800.00	\$ 39,200
	Borrow pit right-of-way	sum	job		86,400
	Ponding area right-of-way	11	acre	800.00	8,800
	Clubhouses	32	each	3,000.00	<u>96,000</u>
	Subtotal for lands and damages				\$ 230,400
	Contingencies				<u>34,600</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 265,000
02.	<u>RELOCATIONS</u>				(\$ 86,000)
.1	<u>Roads</u>				
	Road, bituminous A-3, 1 mile	sum	job		\$ 65,000
	Subtotal for roads				\$ 65,000
	Contingencies				<u>10,200</u>
	Subtotal for roads exclusive of right-of-way				\$ 75,200
	Right-of-way costs for roads, including contingencies				<u>6,800</u>
	TOTAL FOR ROADS				\$ 82,000
	Operation and maintenance during construction, including contingencies				<u>4,000</u>
	TOTAL FOR RELOCATIONS				\$ 86,000
11.	<u>LEVEES AND FLOODWALLS</u>				(\$ 7,000)
	<u>NORTH</u>				
	Excavation, ditch	30	cu.yd.	0.75	\$ 225
	<u>SOUTH</u>				
	Excavation, ditch	7,500	cu.yd.	0.75	<u>5,625</u>
	Subtotal				\$ 5,850
	Contingencies				<u>1,150</u>
	TOTAL FOR LEVEES AND FLOODWALLS				\$ 7,000

TABLE T-35 (Cont'd)

<u>Classi- fication No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
30.	<u>ENGINEERING AND DESIGN</u>				\$ 12,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 8,000
	TOTAL NON-FEDERAL COSTS				\$ 378,000
	TOTAL PROJECT COST (July 1963)				\$2,728,000

TABLE T-36
Cost estimate
Meramec River Basin, Missouri - Levee Area No. 5

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
<u>FEDERAL COSTS</u>					
11.	<u>LEVEES AND FLOODWALLS</u>				(\$1,528,000)
	Clearing, levee	93	acre	175.00	\$ 16,275
	Clearing, borrow pit	72	acre	175.00	12,600
	Embankment	810,000	cu.yd.	0.75	607,500
	Seeding and mulching	61	acre	200.00	12,200
	Revetment, riverbank	99,800	ton	5.00	499,000
	Grading, riverbank	106,000	cu.yd.	0.30	31,800
	Road surfacing	8,830	ton	4.00	35,320
	Relief wells	29	each	2000.00	58,000
<u>SOUTH</u>					
	Excavation, ponding area	19,500	cu.yd.	0.75	<u>14,625</u>
	Subtotal				\$1,287,320
	Contingencies				<u>195,680</u>
	Subtotal for levees and floodwalls				\$1,483,000
	Operation and maintenance during construction, including contingencies				<u>45,000</u>
	TOTAL FOR LEVEES AND FLOODWALLS				\$1,528,000
13.	<u>PUMPING PLANTS</u>				(\$1,142,000)
	South pump station	155	c.f.s.	1800.00	\$ 279,000
	North pump station	654	c.f.s.	1075.00	<u>703,050</u>
	Subtotal				\$ 982,050
	Contingencies				<u>150,950</u>
	Subtotal for pumping plants				\$1,133,000
	Operation and maintenance during construction, including contingencies				<u>9,000</u>
	TOTAL FOR PUMPING PLANTS				\$1,142,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 339,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 221,000
	TOTAL FEDERAL COSTS				\$3,230,000

TABLE T-36 (Cont'd)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
<u>NON-FEDERAL COSTS</u>					
01.	<u>LANDS AND DAMAGES</u>				(\$286,000)
	Levee right-of-way	93	acre	800.00	\$ 74,400
	Borrow pit, right-of-way	sum	job		121,500
	Ponding area right-of-way	9	acre	800.00	7,200
	Clubhouses	15	each	3000.00	45,000
	Subtotal for lands and damages				\$248,100
	Contingencies				<u>37,900</u>
	TOTAL FOR LANDS AND DAMAGES				\$286,000
02.	<u>RELOCATIONS</u>				(\$ 34,000)
.1	<u>Roads</u>				
	Road, bituminous, A-3, .2 mile	sum	job		\$ 13,000
	Road, crushed stone, .4 mile	sum	job		<u>9,600</u>
	Subtotal for roads				\$ 22,600
	Contingencies				<u>3,400</u>
	Subtotal for roads, exclusive of right-of-way				\$ 26,000
	Right-of-way costs for roads, including contingencies				<u>4,000</u>
	Total for roads				\$ 30,000
	Operation and maintenance during construction, including contingencies				<u>4,000</u>
	TOTAL FOR RELOCATIONS				\$ 34,000

TABLE T-36 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>NON-FEDERAL COSTS</u>					
11.	<u>LEVEES AND FLOODWALLS</u>				(\$ 10,000)
	<u>SOUTH</u>				
	Excavation, ditch	2,000	cu.yd.	0.75	\$ 1,500
	<u>NORTH</u>				
	Excavation, ditch	9,000	cu.yd.	0.75	<u>6,750</u>
	Subtotal				\$ 8,250
	Contingencies				<u>1,750</u>
	TOTAL FOR LEVEES AND FLOODWALLS				\$ 10,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 5,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 4,000
	TOTAL NON-FEDERAL COSTS				\$ 339,000
	TOTAL PROJECT COSTS (July 1963)				\$3,569,000

TABLE T-37
Cost estimate
Meramec River Basin, Missouri - Levee Area No. 7

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>FEDERAL COSTS</u>					
11.	<u>LEVEES AND FLOODWALLS</u>				(\$ 402,000)
	Clearing, levee	22	acre	175.00	\$ 3,850
	Clearing, borrow pit	16	acre	175.00	2,800
	Embankment	101,000	cu.yd.	0.75	75,750
	Seeding and mulching	11	acre	200.00	2,200
	Road surfacing	1,890	ton	4.00	7,560
	Relief wells	2	each	2000.00	4,000
	Closure structure, highway, 6.5' x 36'	sum	job		38,300
	Closure structure, highway, 6.0' x 36'	sum	job		35,400
	Floodwall, reinforced concrete	1,500	lin.ft.	110.00	<u>165,000</u>
	Subtotal				\$ 334,860
	Contingencies				<u>50,140</u>
	Subtotal for levees and floodwalls				\$ 385,000
	Operation and maintenance during construction, including contingencies				<u>17,000</u>
	TOTAL FOR LEVEES AND FLOODWALLS				\$ 402,000
13.	<u>PUMPING PLANTS</u>				(\$ 602,000)
	Pump station	411	c.f.s.	1250.00	\$ <u>513,750</u>
	Subtotal				\$ 513,750
	Contingencies				<u>80,250</u>
	Subtotal for pumping plants				\$ 594,000
	Operation and maintenance during construction, including contingencies				<u>8,000</u>
	TOTAL FOR PUMPING PLANTS				\$ 602,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 128,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 88,000
	TOTAL FEDERAL COSTS				\$1,220,000

TABLE T-37 (Cont'd)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
<u>NON-FEDERAL COSTS</u>					
01.	<u>LANDS AND DAMAGES</u>				(\$ 674,000)
	Levee right-of-way	22	acre	2,800.00	\$ 61,600
	Borrow pit right-of-way	sum	job		15,200
	Houses, brick	4	each	20,000.00	80,000
	Houses, frame	16	each	15,000.00	240,000
	Clubhouses	3	each	3,000.00	9,000
	Store, frame	1	each	30,000.00	30,000
	Swimming pool	1	each	150,000.00	150,000
	Subtotal for lands and damages				\$ 585,800
	Contingencies				<u>88,200</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 674,000
	TOTAL NON-FEDERAL COSTS				\$ 674,000
	TOTAL PROJECT COSTS (July, 1963)				\$1,894,000

TABLE T-38
Cost estimate
Meramec River Basin, Missouri - Levee Area No. 8

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>FEDERAL COSTS</u>					
11.	<u>LEVEES AND FLOODWALLS</u>				(\$203,000)
	Clearing, levee	32	acre	175.00	\$ 5,600
	Clearing, borrow pit	15	acre	175.00	2,625
	Embankment	147,000	cu.yd.	0.75	110,250
	Seeding and mulching	16	acre	200.00	3,200
	Road surfacing	3,600	ton	4.00	14,400
	Relief wells	7	each	2000.00	14,000
	Excavation, ponding area	21,000	cu.yd.	0.75	15,750
	Subtotal				\$165,825
	Contingencies				25,175
	Subtotal for levees and floodwalls				\$191,000
	Operation and maintenance during construction, including contingencies				12,000
	TOTAL FOR LEVEES AND FLOODWALLS				\$203,000
13.	<u>PUMPING PLANTS</u>				(\$373,000)
	Pump station	188	c.f.s.	1700.00	\$319,600
	Subtotal				\$319,600
	Contingencies				48,400
	Subtotal for pumping plants				\$368,000
	Operation and maintenance during construction, including contingencies				5,000
	TOTAL FOR PUMPING PLANTS				\$373,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 73,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 49,000
	TOTAL FEDERAL COSTS				\$698,000

TABLE T-38 (Cont'd)

<u>Classification</u> <u>No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit</u> <u>price</u>	<u>Total esti-</u> <u>mated cost</u>
<u>NON-FEDERAL COSTS</u>					
01.	<u>LANDS AND DAMAGES</u>				(\$108,000)
	Levee right-of-way	32	acre	800.00	\$ 25,600
	Borrow pit right-of-way	sum	job		22,000
	Ponding area right-of-way	2	acre	800.00	1,600
	Clubhouses	15	each	3000.00	45,000
	Subtotal for lands and damages				\$ 94,200
	Contingencies				13,800
	TOTAL FOR LANDS AND DAMAGES				\$108,000
02.	<u>RELOCATIONS</u>				(\$ 68,000)
.1	<u>Roads</u>				
	Road, crushed stone, 0.6 mile	sum	job		\$ 15,000
	Bridge, highway	sum	job		39,000
	Subtotal for roads				\$ 54,000
	Contingencies				8,000
	Subtotal for roads, exclusive of right-of-way				\$ 62,000
	Right-of-way costs for roads, including contingencies				4,000
	Total for roads				\$ 66,000
	Operation and maintenance during construction, including contingencies				2,000
	TOTAL FOR RELOCATIONS				\$ 68,000
11.	<u>LEVEES AND FLOODWALLS</u>				(\$ 2,000)
	Excavation, ditch	1,500	cu.yd.	0.75	\$ 1,125
	Subtotal				\$ 1,125
	Contingencies				875
	TOTAL FOR LEVEES AND FLOODWALLS				\$ 2,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 9,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 6,000
	TOTAL NON-FEDERAL COSTS				\$193,000
	TOTAL PROJECT COSTS (July, 1963)				\$891,000

TABLE T-39
Cost estimate
Meramec River Basin, Missouri - Levee Area No. 9

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>FEDERAL COSTS</u>					
11.	<u>LEVEES AND FLOODWALLS</u>				(\$ 337,000)
	Clearing, levee	50	acre	175.00	\$ 8,750
	Clearing, borrow pit	27	acre	175.00	4,725
	Embankment	227,000	cu.yd.	0.75	170,250
	Seeding and mulching	25	acre	200.00	5,000
	Road surfacing	5,430	ton	4.00	21,720
	Relief wells	2	each	2,000.00	4,000
	Excavation, ponding area	91,000	cu.yd.	0.75	68,250
	Subtotal				\$ 282,695
	Contingencies				42,305
	Subtotal for levees and floodwalls				\$ 325,000
	Operation and maintenance during construction, including contingencies				12,000
	TOTAL FOR LEVEES AND FLOODWALLS				\$ 337,000
13.	<u>PUMPING PLANTS</u>				(\$ 844,000)
	Pump station	684	c.f.s.l.	1,060.00	\$ 725,040
	Subtotal				\$ 725,040
	Contingencies				113,960
	Subtotal for pumping plants				\$ 839,000
	Operation and maintenance during construction, including contingencies				5,000
	TOTAL FOR PUMPING PLANTS				\$ 844,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 151,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 98,000
	TOTAL FEDERAL COSTS				\$1,430,000

TABLE T-39 (Cont'd)

<u>Classification</u> <u>No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit</u> <u>price</u>	<u>Total esti-</u> <u>mated cost</u>
<u>NON-FEDERAL COSTS</u>					
01.	<u>LANDS AND DAMAGES</u>				(\$ 165,000)
	Levee right-of-way	50	acre	800.00	\$ 40,000
	Borrow pit right-of-way	sum	job		34,000
	Ponding area right-of-way	12	acre	800.00	9,600
	Clubhouses	20	each	3,000.00	<u>60,000</u>
	Subtotal for lands and damages				\$ 143,600
	Contingencies				<u>21,400</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 165,000
02.	<u>RELOCATIONS</u>				(\$ 41,000)
.1	<u>Roads</u>				
	Road, bituminous -				
	.5 mile	sum	job		<u>\$ 32,500</u>
	Subtotal for roads				\$ 32,500
	Contingencies				<u>4,500</u>
	Subtotal for roads, exclusive of right-of-way				\$ 37,000
	Right-of-way costs for roads, including contingencies				<u>3,000</u>
	Total for roads				\$ 40,000
	Operation and maintenance during construction, including contingencies				<u>\$ 1,000</u>
	TOTAL FOR RELOCATIONS				\$ 41,000

TABLE T-39 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>NON-FEDERAL COSTS (Cont'd)</u>					
11.	<u>LEVEES AND FLOODWALLS</u>				(\$ 4,000)
	Excavation, ditch	4,000	cu.yd.	0.75	<u>\$ 3,000</u>
	Subtotal				\$ 3,000
	Contingencies				<u>1,000</u>
	TOTAL FOR LEVEES AND FLOODWALLS				\$ 4,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 6,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 4,000
	TOTAL NON-FEDERAL COSTS				\$ 220,000
	TOTAL PROJECT COST (July 1963)				\$1,650,000

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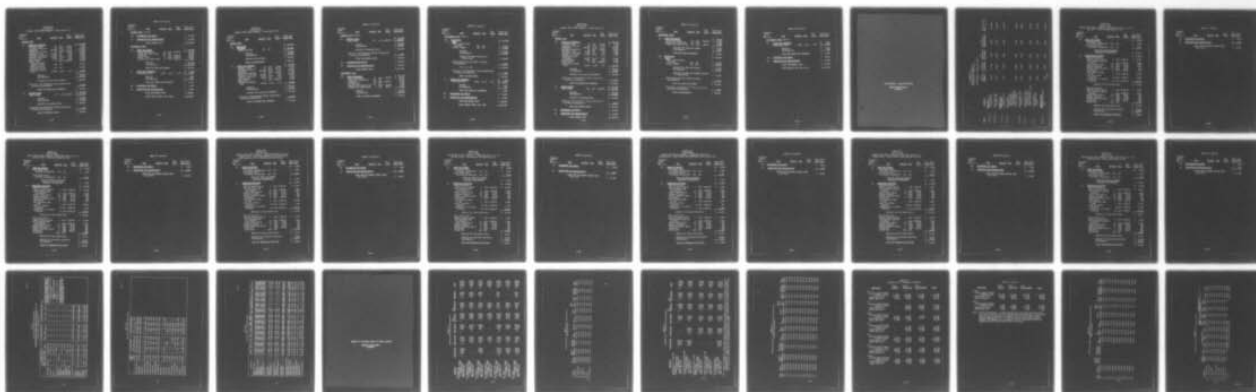
ARMY ENGINEER DISTRICT ST LOUIS MO
MERAMEC RIVER, MISSOURI COMPREHENSIVE BASIN STUDY. VOLUME VIII.--ETC(U)
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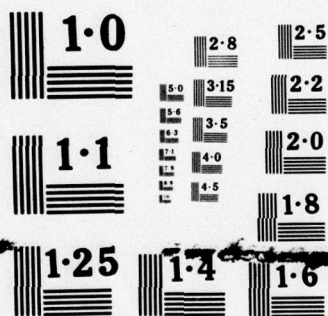
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TABLE T-40
Cost estimate
Meramec River Basin, Missouri - Levee Area No. 11

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>FEDERAL COSTS</u>					
11.	<u>LEVEES AND FLOODWALL</u>				(\$ 723,000)
	Clearing, levee	46	acre	175.00	\$ 8,050
	Clearing, borrow pit	36	acre	175.00	6,300
	Embankment	458,000	cu.yd.	0.75	343,500
	Seeding and mulching	30	acre	200.00	6,000
	Revetment, levee	14,800	ton	5.00	74,000
	Revetment, river bank	10,900	ton	5.00	54,500
	Grading, river bank	11,500	cu.yd.	0.30	3,450
	Road surfacing	4,470	ton	4.00	17,880
	Relief wells	8	each	2,000.00	16,000
	Closure structure, Highway 3.0'x36'	sum	job		24,650
	Closure structure, Railroad 6.0'x37'	sum	job		35,800
	Excavation, ponding area	22,000	cu.yd.	0.75	<u>16,500</u>
	Subtotal				\$ 606,630
	Contingencies				<u>87,370</u>
	Subtotal for levee and floodwall				\$ 694,000
	Operation and maintenance during construction, including contingencies				<u>29,000</u>
	TOTAL FOR LEVEES AND FLOODWALLS				\$ 723,000
13.	<u>PUMPING PLANTS</u>				(\$ 393,000)
	Pump station	211	c.f.s.	1,600.00	<u>\$ 337,600</u>
	Subtotal				\$ 337,600
	Contingencies				<u>50,400</u>
	Subtotal for pumping plants				\$ 388,000
	Operations and maintenance during construction, including contingencies				<u>\$ 5,000</u>
	TOTAL FOR PUMPING PLANTS				\$ 393,000

TABLE T-40 (Cont'd)

<u>Classification No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total estimated cost</u>
<u>FEDERAL COSTS (Cont'd)</u>					
30.	<u>ENGINEERING AND DESIGN</u>				\$ 141,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 93,000
	TOTAL FEDERAL COSTS				\$1,350,000
<u>NON-FEDERAL COSTS</u>					
01.	<u>LANDS AND DAMAGES</u>				(\$ 282,000)
	Levee right-of-way	46	acre	1,700.00	\$ 78,200
	Borrow pit right-of-way	sum	job		68,680
	Clubhouses	15	each	3,000.00	45,000
	Houses, frame	8	each	6,000.00	48,000
	Ponding area right-of-way	3	acre	1,700.00	5,100
	Subtotal				\$ 244,980
	Contingencies				37,020
	TOTAL FOR LANDS AND DAMAGES				\$ 282,000
11.	<u>LEVEES AND FLOODWALLS</u>				(\$ 4,000)
	Excavation, ditch	4,000	cu.yd.	0.75	\$ 3,000
	Subtotal				\$ 3,000
	Contingencies				1,000
	TOTAL FOR LEVEES AND FLOODWALLS				\$ 4,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 1,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 2,000
	TOTAL NON-FEDERAL COSTS				\$ 289,000
	TOTAL PROJECT COSTS (July 1963)				\$1,639,000

TABLE T-41
Cost estimate
Meramec River Basin, Missouri - Levee Area No. 12

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>FEDERAL COSTS</u>					
02.	<u>RELOCATIONS</u>				(\$ 284,000)
.2	<u>Railroads</u>				
	Bridge, railroad	sum	job		<u>\$ 247,000</u>
	Subtotal				\$ 247,000
	Contingencies				<u>37,000</u>
	Subtotal for railroads				\$ 284,000
	TOTAL FOR RELOCATIONS				\$ 284,000
11.	<u>LEVEES AND FLOODWALL</u>				(\$ 741,000)
	Clearing, levee	62	acre	175.00	\$ 10,850
	Clearing, borrow pit	49	acre	175.00	8,575
	Embankment	423,000	cu.yd.	0.75	317,250
	Seeding and mulching	37	acre	200.00	7,400
	Revetment, river bank	43,300	ton	5.00	216,500
	Grading, river bank	32,500	cu.yd.	0.30	9,750
	Road surfacing	4,050	ton	4.00	16,200
	Relief wells	2	each	2,000.00	4,000
	Excavation, ponding area	40,000	cu.yd.	0.75	<u>30,000</u>
	Subtotal				\$ 620,525
	Contingencies				<u>91,475</u>
	Subtotal for levees and floodwalls				\$ 712,000
	Operation and maintenance during construction, including contingencies				<u>29,000</u>
	TOTAL FOR LEVEES AND FLOODWALLS				\$ 741,000

TABLE T-41 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>FEDERAL COSTS (Cont'd)</u>					
13.	<u>PUMPING PLANTS</u>				(\$ 559,000)
	Pump station	474	c.f.s.	1,020.00	\$ 483,480
	Subtotal				\$ 483,480
	Contingencies				70,520
	Subtotal for pumping plants				\$ 554,000
	Operation and maintenance during construction, including contingencies				\$ 5,000
	TOTAL FOR PUMPING PLANTS				\$ 559,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 200,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 126,000
	TOTAL FEDERAL COSTS				\$1,910,000
<u>NON-FEDERAL COSTS</u>					
01.	<u>LANDS AND DAMAGES</u>				(\$ 201,000)
	Levee right-of-way	62	acre	800.00	\$ 49,600
	Borrow pit right-of-way	sum	job		63,450
	Clubhouses	18	each	3,000.00	54,000
	Peerless Park	sum	job		2,000
	Peerless Park right-of-way	2	acre	800.00	1,600
	Ponding area right-of-way	5	acre	800.00	4,000
	Subtotal				\$ 174,650
	Contingencies				26,350
	TOTAL FOR LANDS AND DAMAGES				\$ 201,000

TABLE T-41 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>NON-FEDERAL COSTS (Cont'd)</u>					
02.	<u>RELOCATIONS</u>				(\$ 143,000)
.1	<u>Roads</u>				
	Road, crushed stone				
	1.5 mile	sum	job	\$	36,000
	Bridge, highway	sum	job		<u>78,800</u>
	Subtotal			\$	114,800
	Contingencies				<u>17,200</u>
	Subtotal for roads exclusive of rights-of-way			\$	132,000
	Right-of-way costs for roads, including contingencies				<u>10,000</u>
	Total for roads			\$	142,000
	Operation and maintenance during construction, including contingencies				<u>1,000</u>
	TOTAL FOR RELOCATIONS			\$	143,000
11.	<u>LEVEES AND FLOODWALLS</u>				(\$ 4,000)
	Ditch-excavation	4,500	cu.yd.	0.75	<u>\$ 3,375</u>
	Subtotal			\$	3,375
	Contingencies				<u>625</u>
	TOTAL FOR LEVEES AND FLOODWALLS			\$	4,000
30.	<u>ENGINEERING AND DESIGN</u>			\$	23,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>			\$	12,000
	TOTAL NON-FEDERAL COSTS			\$	383,000
	TOTAL PROJECT COSTS (July 1963)				\$2,293,000

TABLE T-42
Cost estimate
Meramec River Basin, Missouri - Levee Area No. 17

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>FEDERAL COSTS</u>					
11.	<u>LEVEES AND FLOODWALLS</u>				(\$ 289,000)
	Clearing, levee	14	acre	175.00	\$ 2,450
	Clearing, borrow pit	22	acre	175.00	3,850
	Embankment	140,000	cu.yd.	0.75	105,000
	Seeding and mulching	10	acre	200.00	2,000
	Revetment, levee	2,380	ton	5.00	11,900
	Revetment, river bank	4,200	ton	5.00	21,000
	Grading, river bank	2,780	cu.yd.	0.30	834
	Excavation, creek diversion	53,500	cu.yd.	0.50	26,750
	Road surfacing	1,820	ton	4.00	7,280
	Relief wells	2	each	2,000.00	4,000
	Excavation, ponding area	74,000	cu.yd.	0.75	55,500
	Subtotal				\$ 240,564
	Contingencies				35,436
	Subtotal for levees and floodwalls				\$ 276,000
	Operations and maintenance during construction, including contingencies				13,000
	TOTAL FOR LEVEES AND FLOODWALLS				\$ 289,000
13.	<u>PUMPING PLANTS</u>				(\$ 781,000)
	Pump station	624	cfs	1,080.00	\$ 673,920
	Subtotal				\$ 673,920
	Contingencies				102,080
	Subtotal for pumping plants				\$ 776,000
	Operations and maintenance during construction, including contingencies				5,000
	TOTAL FOR PUMPING PLANTS				\$ 781,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 137,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 93,000
	TOTAL FEDERAL COST				\$1,300,000

TABLE T-42 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
<u>NON-FEDERAL COSTS</u>					
01.	<u>LANDS AND DAMAGES</u>				(\$ 46,000)
	Levee right-of-way	14	acre	800.00	\$ 11,200
	Borrow pit right-of-way	sum	job		21,000
	Ponding area right-of-way	10	acre	800.00	<u>8,000</u>
	Subtotal for lands and damages				\$ 40,200
	Contingencies				<u>5,800</u>
	TOTAL FOR LANDS AND DAMAGES				\$ 46,000
02.	<u>RELOCATIONS</u>				(\$ 129,000)
.1	<u>Roads</u>				
	Roads, curbed stone,				
	0.9 mile	sum	job		\$ 22,000
	Bridge, highway	sum	job		<u>74,300</u>
	Subtotal for roads and bridges				\$ 96,300
	Contingencies				<u>14,700</u>
	Subtotal for roads and bridges exclusive of right-of-way				\$ 111,000
	Right-of-way costs for roads, including contingencies				<u>14,000</u>
	Total for roads and bridges				\$ 125,000
	Operations and maintenance during construction, including contingencies				<u>4,000</u>
	TOTAL FOR RELOCATIONS				\$ 129,000

TABLE T-42 (Cont'd)

<u>Classifi-</u> <u>cation</u> <u>No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit</u> <u>price</u>	<u>Total esti-</u> <u>mated cost</u>
<u>NON-FEDERAL COSTS (Cont'd)</u>					
11.	<u>LEVEES AND FLOODWALLS</u>				(\$ 5,000)
	Excavation, ditch	6,000	cu.yd.	0.75	\$ 4,500
	Subtotal				\$ 4,500
	Contingencies				500
	TOTAL FOR LEVEES AND FLOODWALLS				\$ 5,000
30.	<u>ENGINEERING AND DESIGN</u>				\$ 17,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 10,000
	TOTAL NON-FEDERAL COSTS				\$ 207,000
	TOTAL PROJECT COST (July 1963)				\$1,507,000

COST ESTIMATE - ANGLER-USE SITES

**MERAMEC RIVER BASIN,
MISSOURI**

TABLE T-43
Meramec River Missouri
Comprehensive Basin Study

Cost summary - angler-use sites

Sites	Location	01. Lands and damages	14. Recreation facilities	30. Engineering and design	31. Supervision & administration	Total project cost
A, B, C, & D	<u>BIG RIVER</u>					
	Below Irondale Reservoir (9)	8,000	97,000	9,000	3,000	117,000
E, F, G, H & I	Below Pine Ford Reservoir (2A)	10,000	110,000	11,000	3,000	134,000
	<u>MERAMEC RIVER</u>					
J, K & L	Below Salem Reservoir (27)	6,000	69,000	7,000	2,000	84,000
M, N & O	Below Salem Reservoir (27)					
	and/or Spring Creek Reservoir (I-28) (downstream Maramec Spring)	6,000	69,000	7,000	2,000	84,000
P, Q & R	Below Meramec Park Reservoir (17)	6,000	69,000	7,000	2,000	84,000
	Below Huzzah Creek Reservoir (I-14) and/or West Fork Huzzah Reservoir (I-26)	4,000	41,000	4,000	1,000	50,000
S & T	Below Huzzah Creek Reservoir (I-14) and/or West Fork Huzzah Reservoir (I-26)	4,000	41,000	4,000	1,000	50,000
	Below Courtols Creek Reservoir (I-15A)	4,000	41,000	4,000	1,000	50,000
U & V	Below Courtols Creek Reservoir (I-15A)	4,000	41,000	4,000	1,000	50,000
W, X, Y & Z	<u>BOURBEUSE RIVER</u>					
	Below Union Reservoir (29)	8,000	97,000	9,000	3,000	117,000

TABLE T-44
Cost estimate
Meramec River Basin, Missouri - Angler-Use Sites A, B, C, & D
Big River - Below Irondale Reservoir (9)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$ 8,000)
	Road access sites, including contingencies	sum	job		\$ 6,000
	Boat access sites, including contingencies	sum	job		<u>2,000</u>
	TOTAL FOR LANDS AND DAMAGES, INCLUDING CONTINGENCIES				\$ 8,000
14.	<u>RECREATION FACILITIES</u>				(\$ 97,000)
	Road access sites				
	Comfort station (SC-2)	3	each	6,000.00	\$ 18,000
	Well w/pitcher pump and platform	3	each	2,000.00	6,000
	Picnic tables (PT-2)	30	each	55.00	1,650
	Barbecue braziers	15	each	65.00	975
	Refuse containers (SR-1)	12	each	45.00	540
	Incinerator	3	each	300.00	900
	Boat launching ramp, 1-lane	3	each	5,000.00	15,000
	Road, A-1 surface treatment	.36 mile		8,000.00	2,880
	Parking lot, A-1 surface treatment	1.8 acre		15,000.00	<u>27,000</u>
	Subtotal for road access sites				\$ 72,945
	Boat access sites				
	Comfort station (SC-2)	1	each	6,000.00	\$ 6,000
	Well w/pitcher pump and platform	1	each	2,000.00	2,000
	Picnic tables (PT-2)	10	each	55.00	550
	Barbecue braziers	5	each	65.00	325
	Refuse containers (SR-1)	4	each	45.00	180
	Incinerator	1	each	300.00	300
	Access road	sum	job		<u>2,200</u>
	Subtotal for boat access sites				\$ 11,555
	Subtotal for recreation facilities				\$ 84,500
	Contingencies				<u>12,500</u>
	TOTAL FOR RECREATION FACILITIES				\$ 97,000

TABLE T-44 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
30.	<u>ENGINEERING AND DESIGN</u>				\$ 9,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 3,000
	TOTAL COST FOR STREAM FISHING SITES (July 1963)				\$ 117,000

TABLE T-45
Cost estimate
Meramec River Basin, Missouri - Angler-Use Sites E, F, G, H, & I
Big River - Below Pine Ford Reservoir (2A)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$ 10,000)
	Road access sites, including contingencies	sum	job		\$ 6,000
	Boat access sites, including contingencies	sum	job		<u>4,000</u>
	TOTAL FOR LANDS AND DAMAGES, INCLUDING CONTINGENCIES				\$ 10,000
14.	<u>RECREATION FACILITIES</u>				(\$ 110,000)
	Road access sites				
	Comfort station (SC-2)	3	each	6,000.00	\$ 18,000
	Well w/pitcher pump and platform	3	each	2,000.00	6,000
	Picnic tables (PT-2)	30	each	55.00	1,650
	Barbecue braziers	15	each	65.00	975
	Refuse containers (SR-1)	12	each	45.00	540
	Incinerator	3	each	300.00	900
	Boat launching ramp, 1-lane	3	each	5,000.00	15,000
	Road, A-1 surface treatment	.36 mile		8,000.00	2,880
	Parking lot, A-1 surface treatment	1.8 acre		15,000.00	<u>27,000</u>
	Subtotal for road access sites				\$ 72,945
	Boat access sites				
	Comfort station (SC-2)	2	each	6,000.00	\$ 12,000
	Well w/pitcher pump and platform	2	each	2,000.00	4,000
	Picnic tables (PT-2)	20	each	55.00	1,100
	Barbecue braziers	10	each	65.00	650
	Refuse containers (SR-1)	8	each	45.00	360
	Incinerator	2	each	300.00	600
	Access road	sum	job		<u>4,400</u>
	Subtotal for boat access sites				\$ 23,110
	Subtotal for recreation facilities				\$ 96,055
	Contingencies				<u>13,945</u>
	TOTAL FOR RECREATION FACILITIES				\$ 110,000

TABLE T-45 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
30.	<u>ENGINEERING AND DESIGN</u>				\$ 11,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 3,000
TOTAL COST FOR STREAM FISHING SITES (July 1963)					\$ 134,000

TABLE T-46
Cost estimate
Meramec River Basin, Missouri - Angler-Use Sites J, K, & L
Meramec River - Below Salem Reservoir (27)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$ 6,000)
	Road access sites, including contingencies	sum	job		\$ 4,000
	Boat access sites, including contingencies	sum	job		<u>2,000</u>
	TOTAL FOR LANDS AND DAMAGES, INCLUDING CONTINGENCIES				\$ 6,000
14.	<u>RECREATION FACILITIES</u>				(\$ 69,000)
	Road access sites				
	Comfort station (SC-2)	2	each	6,000.00	\$ 12,000
	Well w/pitcher pump and platform	2	each	2,000.00	4,000
	Picnic tables (PT-2)	20	each	55.00	1,100
	Barbecue braziers	10	each	65.00	650
	Refuse containers (SR-1)	8	each	45.00	360
	Incinerator	2	each	300.00	600
	Boat launching ramp, 1-lane	2	each	5,000.00	10,000
	Road, A-1 surface treatment	.24	mile	8,000.00	1,920
	Parking lot, A-1 surface treatment	1.2	acre	15,000.00	<u>18,000</u>
	Subtotal for road access sites				\$ 48,630
	Boat access sites				
	Comfort stations, SC-2	1	each	6,000.00	\$ 6,000
	Well w/pitcher pump and platform	1	each	2,000.00	2,000
	Picnic tables (PT-2)	10	each	55.00	550
	Barbecue braziers	5	each	65.00	325
	Refuse containers (SR-1)	4	each	45.00	180
	Incinerator	1	each	300.00	300
	Access Road	sum	job		<u>2,200</u>
	Subtotal for boat access sites				\$ 11,555
	Subtotal for recreation facilities				\$ 60,185
	Contingencies				<u>8,815</u>
	TOTAL FOR RECREATION FACILITIES				\$ 69,000

TABLE T-46 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
30.	<u>ENGINEERING AND DESIGN</u>				\$ 7,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 2,000
TOTAL COST FOR STREAM FISHING SITES (July 1963)					\$ 84,000

TABLE T-47

Cost estimate

Meramec River Basin, Missouri - Angler-Use Sites M, N, & O
 Meramec River - Below Salem Reservoir (27) and/or Spring
 Creek Reservoir (I-28) (downstream Maramec Spring)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.	<u>LANDS AND DAMAGES</u>				(\$ 6,000)
	Road access sites, including contingencies	sum	job		\$ 4,000
	Boat access sites, including contingencies	sum	job		<u>2,000</u>
	TOTAL FOR LANDS AND DAMAGES, INCLUDING CONTINGENCIES				\$ 6,000
14.	<u>RECREATION FACILITIES</u>				(\$ 69,000)
	Road access sites				
	Comfort station (SC-2)	2	each	6,000.00	\$ 12,000
	Well w/pitcher pump and platform	2	each	2,000.00	4,000
	Picnic tables (PT-2)	20	each	55.00	1,100
	Barbecue braziers	10	each	65.00	650
	Refuse containers (SR-1)	8	each	45.00	360
	Incinerator	2	each	300.00	600
	Boat launching ramp, 1-lane	2	each	5,000.00	10,000
	Road, A-1 surface treatment	.24 mile		8,000.00	1,920
	Parking lot, A-1 surface treatment	1.2 acre		15,000.00	<u>18,000</u>
	Subtotal for road access sites				\$ 48,630
	Boat access sites				
	Comfort stations (SC-2)	1	each	6,000.00	\$ 6,000
	Well w/pitcher pump and platform	1	each	2,000.00	2,000
	Picnic tables (PT-2)	10	each	55.00	550
	Barbecue braziers	5	each	65.00	325
	Refuse containers (SR-1)	4	each	45.00	180
	Incinerator	1	each	300.00	300
	Access road	sum	job		<u>2,200</u>
	Subtotal for boat access sites				\$ 11,555
	Subtotal for recreation facilities				60,185
	Contingencies				<u>8,815</u>
	TOTAL FOR RECREATION FACILITIES				\$ 69,000

TABLE T-47 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
30.	<u>ENGINEERING AND DESIGN</u>				\$ 7,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 2,000
TOTAL COST FOR STREAM FISHING SITES (July 1963)					\$ 84,000

TABLE T-48
Cost estimate
Meramec River Basin, Missouri - Angler-Use Sites P, Q, & R
Meramec River - Below Meramec Park Reservoir (17)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$ 6,000)
	Road access sites, including contingencies	sum	job		\$ 4,000
	Boat access sites, including contingencies	sum	job		<u>2,000</u>
	TOTAL FOR LANDS AND DAMAGES, INCLUDING CONTINGENCIES				\$ 6,000
14.	<u>RECREATION FACILITIES</u>				(\$ 69,000)
	Road access sites				
	Comfort station (SC-2)	2	each	6,000.00	\$ 12,000
	Well w/pitcher pump and platform	2	each	2,000.00	4,000
	Picnic tables (PT-2)	20	each	55.00	1,100
	Barbecue braziers	10	each	65.00	650
	Refuse containers (SR-1)	8	each	45.00	360
	Incinerator	2	each	300.00	600
	Boat launching ramp, 1-lane	2	each	5,000.00	10,000
	Road, A-1 surface treatment	.24	mile	8,000.00	1,920
	Parking lot, A-1 surface treatment	1.2	acre	15,000.00	<u>18,000</u>
	Subtotal for road access sites				\$ 48,630
	Boat access sites				
	Comfort stations (SC-2)	1	each	6,000.00	\$ 6,000
	Well w/pitcher pump and platform	1	each	2,000.00	2,000
	Picnic tables (PT-2)	10	each	55.00	550
	Barbecue braziers	5	each	65.00	325
	Refuse containers (SR-1)	4	each	45.00	180
	Incinerator	1	each	300.00	300
	Access road	sum	job		<u>2,200</u>
	Subtotal for boat access sites				\$ 11,555
	Subtotal for recreation facilities				\$ 60,185
	Contingencies				<u>8,815</u>
	TOTAL FOR RECREATION FACILITIES				\$ 69,000

TABLE T-48 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
30.	<u>ENGINEERING AND DESIGN</u>				(\$ 7,000)
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 2,000
TOTAL COST FOR STREAM FISHING SITES (July 1963)					\$ 84,000

TABLE T-49
Cost estimate

Meramec River Basin, Missouri - Angler-Use Sites S & T
Meramec River - Below Huzzah Creek Reservoirs (I-14 and/or I-26)

Classifi- cation No.	Item	Quantity	Unit	Unit price	Total esti- mated cost
01.	<u>LANDS AND DAMAGES</u>				(\$ 4,000)
	Road access sites, including contingencies	sum	job		\$ 2,000
	Boat access sites, including contingencies	sum	job		<u>2,000</u>
	TOTAL FOR LAND AND DAMAGES, INCLUDING CONTINGENCIES				\$ 4,000
14.	<u>RECREATION FACILITIES</u>				(\$ 41,000)
	Road access sites				
	Comfort station (SC-2)	1	each	6,000.00	\$ 6,000
	Well w/pitcher pump and platform	1	each	2,000.00	2,000
	Picnic tables (PT-2)	10	each	55.00	550
	Barbecue braziers	5	each	65.00	325
	Refuse containers (SR-1)	4	each	45.00	180
	Incinerator	1	each	300.00	300
	Boat launching ramp, 1-lane	1	each	5,000.00	5,000
	Road, A-1 surface treatment	.12 mile		8,000.00	960
	Parking lot, A-1 surface treatment	.6 acre		15,000.00	<u>9,000</u>
	Subtotal for road access sites				\$ 24,315
	Boat access sites				
	Comfort stations (SC-2)	1	each	6,000.00	\$ 6,000
	Well w/pitcher pump and platform	1	each	2,000.00	2,000
	Picnic tables (PT-2)	10	each	55.00	550
	Barbecue braziers	5	each	65.00	325
	Refuse containers (SR-1)	4	each	45.00	180
	Incinerator	1	each	300.00	300
	Access road	sum	job		<u>2,200</u>
	Subtotal for boat access sites				\$ 11,555
	Subtotal for recreation facilities				35,870
	Contingencies				<u>5,130</u>
	TOTAL FOR RECREATION FACILITIES				\$ 41,000

TABLE T-49 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
30.	<u>ENGINEERING AND DESIGN</u>				\$ 4,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 1,000
	TOTAL COST FOR STREAM FISHING SITES (July 1963)				\$ 50,000

TABLE T-50
Cost estimate
Meramec River Basin, Missouri - Angler-Use Sites U & V
Meramec River - Below Courtois Creek Reservoir (I-15A)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$ 4,000)
	Road access sites, including contingencies	sum	job		\$ 2,000
	Boat access sites, including contingencies	sum	job		<u>2,000</u>
	TOTAL FOR LANDS AND DAMAGES, INCLUDING CONTINGENCIES				\$ 4,000
14.	<u>RECREATION FACILITIES</u>				(\$ 41,000)
	Road access sites				
	Comfort station (SC-2)	1	each	6,000.00	\$ 6,000
	Well w/pitcher pump and platform	1	each	2,000.00	2,000
	Picnic tables (PT-2)	10	each	55.00	550
	Barbecue braziers	5	each	65.00	325
	Refuse containers (SR-1)	4	each	45.00	180
	Incinerator	1	each	300.00	300
	Boat launching ramp, 1-lane	1	each	5,000.00	5,000
	Road, A-1 surface treatment	.12 mile		8,000.00	960
	Parking lot, A-1 surface treatment	.6 acre		15,000.00	<u>9,000</u>
	Subtotal for road access sites				\$ 24,315
	Boat access sites				
	Comfort stations (SC-2)	1	each	6,000.00	\$ 6,000
	Well w/pitcher pump and platform	1	each	2,000.00	2,000
	Picnic tables (PT-2)	10	each	55.00	550
	Barbecue braziers	5	each	65.00	325
	Refuse containers (SR-1)	4	each	45.00	180
	Incinerator	1	each	300.00	300
	Access road	sum	job		<u>2,200</u>
	Subtotal for boat access sites				\$ 11,555
	Subtotal for recreation facilities				\$ 35,870
	Contingencies				<u>5,130</u>
	TOTAL FOR RECREATION FACILITIES				\$ 41,000

TABLE T-50 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
30.	<u>ENGINEERING AND DESIGN</u>				\$ 4,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				\$ 1,000
	TOTAL COST FOR STREAM FISHING SITES (July 1963)				\$ 50,000

TABLE T-51
Cost estimate
Meramec River Basin, Missouri - Angler-Use Sites W, X, Y, & Z
Bourbeuse River - Below Union Reservoir (29)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
01.	<u>LANDS AND DAMAGES</u>				(\$ 8,000)
	Road access sites, including contingencies	sum	job		\$ 6,000
	Boat access sites, including contingencies	sum	job		<u>2,000</u>
	TOTAL FOR LANDS AND DAMAGES, INCLUDING CONTINGENCIES				\$ 8,000
14.	<u>RECREATION FACILITIES</u>				(\$ 97,000)
	Road access sites				
	Comfort station (SC-2)	3	each	6,000.00	\$ 18,000
	Well w/pitcher pump and platform	3	each	2,000.00	6,000
	Picnic tables (PT-2)	30	each	55.00	1,650
	Barbecue braziers	15	each	65.00	975
	Refuse containers (SR-1)	12	each	45.00	540
	Incinerator	3	each	300.00	900
	Boat launching ramp, 1-lane	3	each	5,000.00	15,000
	Road A-1 surface treatment	.36 mile		8,000.00	2,880
	Parking lot, A-1 surface treatment	1.8 acre		15,000.00	<u>27,000</u>
	Subtotal for road access sites				\$ 72,945
	Boat access sites				
	Comfort station (SC-2)	1	each	6,000.00	\$ 6,000
	Well w/pitcher pump and platform	1	each	2,000.00	2,000
	Picnic tables (PT-2)	10	each	55.00	550
	Barbecue braziers	5	each	65.00	325
	Refuse containers (SR-1)	4	each	45.00	180
	Incinerator	1	each	300.00	300
	Access road	sum	job		<u>2,200</u>
	Subtotal for boat access sites				\$ 11,555
	Subtotal for recreation facilities				\$ 84,500
	Contingencies				<u>12,500</u>
	TOTAL FOR RECREATION FACILITIES				\$ 97,000

TABLE T-51 (Cont'd)

<u>Classifi- cation No.</u>	<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit price</u>	<u>Total esti- mated cost</u>
30.	<u>ENGINEERING AND DESIGN</u>				\$ 9,000
31.	<u>SUPERVISION AND ADMINISTRATION</u>				<u>\$ 3,000</u>
TOTAL COST FOR STREAM FISHING SITES (July 1963)					\$ 117,000

COST ALLOCATIONS AND ECONOMIC CHARGES

**MERAMEC RIVER BASIN,
MISSOURI**

ALLOCATION OF COST BY THE SEPARABLE COSTS-REMAINING BENEFITS METHOD

TYPICAL SAMPLE - MERAMEC PARK RESERVOIR

**MERAMEC RIVER BASIN,
MISSOURI**

TABLE T-52
Summary of construction expenditures (100-year life basis)
Marmac Park Reservoir (617) - multiple-purpose for flood control, water quality, water supply,
recreation, fish and wildlife conservation, navigation, and area reorientation
Marmac River, Missouri - Comprehensive Basin Study

	Multiple-purpose project				Alternate single-purpose project				Alternate multiple-purpose projects		
	Specific costs		Fish and wildlife	Remaining joint costs	Total costs	Flood control	Water quality	Recreation	Plan No. 1	Plan No. 2	Plan No. 3
	General recreation										
01 Lands & damages	\$1,498,000	-	-	9,420,000	10,918,000						
02 Relocations	-	-	-	8,147,400	8,147,400						
03 Reservoir	-	-	-	1,427,200	1,427,200						
04 Dam	-	-	-	12,774,500	12,774,500						
06 Fish & wildlife facilities	-	-	\$11,700	-	11,700						
08 Roads, railroads, & bridges	-	-	-	192,900	192,900						
14 Recreation facilities	3,727,700	-	-	-	3,727,700						
19 Building, grounds, & facilities	-	-	-	270,900	270,900						
20 Permanent operating equipment	-	-	-	229,700	229,700						
Total for project	\$5,225,700	\$11,700		\$2,442,600	\$37,700,000	\$27,000,000	\$16,500,000	\$37,600,000	\$29,700,000	\$34,900,000	\$31,000,000
Investment											
Construction expenditures	\$5,225,700	\$11,700		\$2,442,600	\$37,700,000	\$27,000,000	\$16,500,000	\$37,600,000	\$29,700,000	\$34,900,000	\$31,000,000
Construction period	-	-	-	-	-	4	3	4	4	3	4
Interest during construction	391,900	900	900	2,434,700	2,827,500	1,620,000	762,500	1,454,000	1,782,000	2,417,500	1,249,000
Total investment	\$5,617,600	\$12,600		\$24,897,300	\$40,527,500	\$28,620,000	\$17,262,500	\$39,054,000	\$31,482,000	\$37,317,500	\$32,249,000

NOTES:

- Costs for the alternate multiple-purpose projects include costs for a dam and reservoir constructed at the same damsite as the selected plan. Included are applicable charges for all line items of project costs. Storage requirements for the three plans are as follows:
Plan 1 - Net joint-use pool, sedimentation (100 years), and applicable evaporation.
Plan 2 - Net joint-use pool, 50% flood control pool, sedimentation (100 years), and applicable evaporation.
Plan 3 - 50% flood control pool and sedimentation (100 years).
- Alternate cost of single-purpose reservoir for water quality is based on construction of reservoir to meet future needs using increments of development which a prudent user would be likely to adopt. Costs have been discounted to present date.

TABLE T-32 (cont'd)
Summary of costs, charges, and benefits (100-year life basis)

	Multiple-purpose project Total cost	Single-purpose project			Alternate multiple-purpose project		
		Flood control	Water quality	Recreation	Plan No. 1	Plan No. 2	Plan No. 3
Construction expenditures	\$37,700,000	\$27,000,000	\$16,500,000	\$37,600,000	\$29,700,000	\$36,900,000	\$21,000,000
Total investment	\$40,527,500	\$28,620,000	\$17,262,500	\$39,256,000	\$33,482,000	\$37,317,500	\$22,260,000
Annual charges							
Interest on investment	\$1,215,000	\$558,600	\$517,300	\$877,700	\$944,500	\$1,125,500	\$667,000
Amortization of investment	66,900	67,200	28,500	62,300	51,900	61,900	56,700
Operation & maintenance	333,200	17,000	30,500	263,000	296,000	306,000	17,000
Replacement costs	93,000	2,000	2,000	56,000	80,000	85,000	2,000
Supervision/administration	28,000	1,000	3,100	19,000	25,000	25,000	1,000
Total, annual charges	\$1,727,700	\$925,800	\$581,400	\$1,244,000	\$1,397,400	\$1,603,400	\$794,500
Annual benefits							
Flood control	\$785,700	\$785,700	-	-	-	\$379,700	\$379,700
Water quality	546,400	-	\$546,400	-	\$546,400	546,400	-
Water supply	163,300	-	-	-	11,400	163,300	-
General recreation	1,446,600	-	-	\$1,446,600	1,446,600	1,446,600	-
Fish/wildlife recreation	750,500	-	116,300	750,500	750,500	750,500	-
Area reclamation	957,000	52,600	32,200	957,300	957,000	957,000	60,900
Navigational	57,100	-	-	-	57,100	57,100	-
Total annual benefits	\$4,686,600	\$938,300	\$694,900	\$3,134,400	\$3,769,000	\$4,280,600	\$439,600
Benefit-cost ratio	2.7	0.91	1.2	2.5	2.7	2.7	0.6

TABLE 7-12 (cont'd)
Allocation by separable costs - remaining benefits method

Project purpose	Flood control	Water quality	Water supply	Total recreation	General recreation	Total fish and wildlife	Reservoir fish and wildlife	Stream fishery	Area near-Reservoir (construction/oper. devel.)	Local (oper. devel.)	Navigation	Total
Allocation of annual charges												
Benefits	\$ 785,700	\$ 546,400	\$ 143,300	\$ 2,197,100	\$ 1,446,600	\$ 750,500	\$ 739,300	\$ 11,200	\$ 957,000	\$ 73,500	\$ 883,500	\$ 4,686,600
Alternative costs	225,800	581,400	143,300	1,244,000	819,000	429,000	419,600	6,400	957,000	73,500	883,500	3,988,600
Benefits limited by alternate costs	785,700	546,400	143,300	1,244,000	819,000	429,000	419,600	6,400	957,000	73,500	883,500	3,988,600
Separable costs	274,100	96,400	7,300	625,600	572,900	52,700	49,800	2,900	-	-	-	1,093,600
Remainder benefits	511,600	450,000	136,000	618,400	246,100	376,300	369,800	3,500	957,000	73,500	883,500	2,720,100
Allocated joint costs	137,400	121,000	36,400	166,300	66,200	100,100	99,200	900	237,400	19,800	237,600	734,300
Total allocation project cost	\$ 411,700	\$ 217,400	\$ 43,900	\$ 791,900	\$ 639,100	\$ 132,800	\$ 149,000	\$ 3,400	\$ 237,400	\$ 19,800	\$ 237,600	\$ 1,737,700
Benefit-cost ratio	1.9	2.5	3.3	2.6	2.3	6.9	5.0	2.9	3.7	3.7	3.7	2.7
Allocation of O&M costs												
Separable costs	\$ 38,000	\$ 40,800	\$ 1,200	\$ 282,000	\$ 266,100	\$ 15,900	\$ 14,800	\$ 1,100	-	-	-	\$ 363,000
Allocated joint costs	-	-	-	-	-	-	-	-	-	-	-	-
Total allocation, O&M costs	\$ 38,000	\$ 40,800	\$ 1,200	\$ 282,000	\$ 266,100	\$ 15,900	\$ 14,800	\$ 1,100	-	-	-	\$ 363,000
Allocation of replacement costs												
Separable costs	\$ 15,000	\$ 10,800	\$ 300	\$ 69,900	\$ 64,100	\$ 5,800	\$ 5,500	\$ 300	-	-	-	\$ 93,000
Allocated joint costs	-	-	-	-	-	-	-	-	-	-	-	-
Total allocation, replacement costs	\$ 15,000	\$ 10,800	\$ 300	\$ 69,900	\$ 64,100	\$ 5,800	\$ 5,500	\$ 300	-	-	-	\$ 93,000
Allocation of investment												
Annual investment	\$ 361,700	\$ 145,800	\$ 448,600	\$ 649,800	\$ 880,500	\$ 138,100	\$ 128,700	\$ 2,400	\$ 237,400	\$ 19,800	\$ 237,600	\$ 1,282,700
Allocated investment	\$ 11,429,200	\$ 5,239,400	\$ 1,339,000	\$ 13,902,900	\$ 9,739,400	\$ 4,143,300	\$ 4,046,200	\$ 77,100	\$ 8,132,400	\$ 626,400	\$ 7,508,000	\$ 40,527,500
Allocation of construction expenditures												
Specific investment	-	-	-	\$ 5,630,200	\$ 5,437,600	\$ 12,400	-	\$ 12,400	-	-	-	\$ 5,630,200
Investment in joint-use facilities	\$ 11,429,200	\$ 5,239,400	\$ 1,339,000	\$ 8,272,700	\$ 4,142,000	\$ 4,130,700	\$ 4,046,200	\$ 64,500	\$ 8,132,400	\$ 626,400	\$ 7,508,000	\$ 34,897,300
Investment during construction on joint-use facilities	797,300	345,600	93,400	577,200	289,000	289,200	283,700	4,500	567,400	43,400	532,800	2,434,700
Construction expenditures in joint-use facilities	10,630,900	4,874,000	1,245,400	7,495,500	3,855,000	3,842,500	3,782,500	60,000	7,545,200	581,000	6,964,200	33,442,600
Percent of construction expenditures in joint-use facilities	32.75	15.01	3.04	23.71	11.87	11.84	11.45	0.19	23.30	1.79	21.31	1.39
Construction expenditures in specific facilities	-	-	-	\$ 5,237,400	\$ 5,225,700	\$ 11,700	-	\$ 11,700	-	-	-	\$ 5,237,400
Total construction expenditures	\$ 10,630,900	\$ 4,874,000	\$ 1,245,400	\$ 12,732,900	\$ 9,078,700	\$ 3,854,200	\$ 3,782,500	\$ 71,700	\$ 7,545,200	\$ 581,000	\$ 6,964,200	\$ 37,700,000

SUMMARY OF ALLOCATED COSTS AND ANNUAL CHARGES

**MERAMEC RIVER BASIN,
MISSOURI**

TABLE T-53
Allocated costs - main stream reservoirs

Reservoirs	Flood control	Water quality	Water supply	Total recreation	Area reorientation	Navigation	Total
#2A, Pine Ford							
Average annual charges	\$ 375,000	\$ 61,300	\$ 14,600	\$ 438,500	\$ 203,600	\$ 3,900	\$ 1,096,900
Total project cost	9,816,000	1,257,000	308,000	7,037,000	5,673,000	109,000	24,200,000
Annual O&M costs	45,700	19,100	4,300	202,400	13,300	200	285,000
#5, Washington Park							
Average annual charges	-	184,200	41,700	276,600	204,000	15,100	721,600
Total project cost	-	4,432,000	1,032,000	5,837,000	5,119,000	380,000	16,800,000
Annual O&M costs	-	35,500	7,100	80,800	32,200	2,400	158,000
#9, Irondale							
Average annual charges	54,900	155,200	21,200	269,300	138,700	6,600	645,900
Total project cost	724,000	3,770,000	522,000	4,738,000	3,575,000	171,000	13,500,000
Annual O&M costs	30,700	28,700	3,700	110,300	18,700	900	193,000
#40, Virginia Mines							
Average annual charges	-	14,100	-	673,300	280,900	-	968,300
Total project cost	-	285,000	-	11,177,000	6,938,000	-	18,400,000
Annual O&M costs	-	4,500	-	298,300	48,200	-	351,000
#17, Meramec Park							
Average annual charges	411,700	217,400	43,900	791,900	257,400	15,400	1,737,700
Total project cost	10,631,000	4,874,000	1,246,000	12,933,000	7,565,000	451,000	37,700,000
Annual O&M costs	50,000	51,600	1,500	351,900	-	-	455,000
#27, Salem							
Average annual charges	73,800	44,000	17,000	262,200	280,900	-	677,900
Total project cost	1,276,000	1,132,000	441,000	4,346,000	7,705,000	-	14,900,000
Annual O&M costs	31,000	6,000	2,200	116,400	22,400	-	178,000
#29, Union							
Average annual charges	244,900	104,200	237,000	395,700	130,200	10,900	1,122,900
Total project cost	6,155,000	2,975,000	5,445,000	6,834,000	3,868,000	323,000	25,600,000
Annual O&M costs	38,400	4,300	54,400	166,500	400	-	264,000

TABLE T-54
Average annual charges - economic costs (100-year amortization period)
Main stream reservoirs

Reservoir	Project first cost	Interest during construction	Productivity loss during construction	Gross investment	Net salvage value	Net investment	Interest on investment	Amorti- zation of invest- ment	Loss of produc- tivity	Operation, maintenance, replacement	Total annual charges
#24, Pine Ford	\$24,200,000	\$1,452,000	\$ 78,100	\$25,730,000	\$2,581,000	\$23,149,000	\$ 771,900	\$38,200	\$105,700	\$285,000	\$1,200,800
# 5, Washington Park	16,800,000	1,008,000	9,700	17,818,000	499,000	17,319,000	534,500	28,600	16,400	158,000	737,500
# 9, Irondale	13,500,000	810,000	30,700	14,341,000	813,000	13,528,000	430,200	22,300	30,600	193,000	676,100
#17, Maramec Park	37,700,000	2,827,600	151,600	40,679,000	4,702,000	35,977,000	1,220,400	59,400	207,000	455,000	1,941,800
#27, Salem	14,900,000	894,000	17,900	15,812,000	473,000	15,339,000	474,400	25,300	21,400	178,000	699,100
#29, Union	25,600,000	1,536,000	110,100	27,246,000	2,824,000	24,422,000	817,400	40,300	123,100	264,000	1,244,800
#40, Virginia Mines	18,400,000	1,104,000	49,000	19,553,000	1,644,000	17,909,000	586,600	29,500	84,100	351,000	1,051,200

TABLE T-55
Allocated costs - tributary stream reservoirs

<u>Reservoirs</u>	<u>Flood control</u>	<u>Water quality</u>	<u>Water supply</u>	<u>Total recreation</u>	<u>Area reorientation</u>	<u>Total</u>
I-26 (w/I-14 out), West Fork Huzzah Creek						
Average annual charges (financial cost)	\$ 46,400	\$ -	\$ 6,600	\$ 71,600	\$ 72,900	\$ 197,500
Total project cost	991,000	-	172,000	1,178,000	1,939,000	4,280,000
Annual O&M costs	14,100	-	1,000	33,200	9,700	58,000
I-28 (w/I-23 out), Spring Creek						
Average annual charges (financial cost)	47,700	64,200	6,300	87,000	41,600	246,800
Total project cost	908,000	1,321,000	169,000	1,284,000	1,098,000	4,780,000
Annual O&M costs	18,000	21,100	900	45,100	5,900	91,000
I-33A (w/I-32 out), Little Bourbeuse River						
Average annual charges (financial cost)	-	110,500	15,200	63,700	49,500	238,900
Total project cost	-	2,511,000	341,000	1,124,000	1,174,000	5,150,000
Annual O&M costs	-	28,600	4,200	27,000	11,200	71,000
I-35A (w/I-32 out), Brush Creek						
Average annual charges (financial cost)	-	134,800	12,200	64,800	30,700	242,500
Total project cost	-	3,217,000	278,000	957,000	748,000	5,200,000
Annual O&M costs	-	30,000	3,200	33,500	6,300	73,000
I-38, Bourbeuse River						
Average annual charges (financial cost)	67,500	85,000	9,700	108,300	60,400	330,900
Total project cost	1,006,000	1,618,000	211,000	1,253,000	1,522,000	5,610,000
Annual O&M costs	34,700	32,300	2,700	67,500	10,800	148,000

Note: Of the 12 reservoirs, 7 either did not have a favorable over-all benefit-cost ratio or did not have all individual purposes justified. Since one of the criterion in selection of reservoir sites is that it should permit complete development, the 7 reservoirs were not investigated further, pending a determination of the ability of the 21 reservoirs to meet the immediate and near future water needs of the basin.

TABLE T-56
Average annual charges - economic costs (100-year amortization period)
Tributary stream reservoirs

Reser- voir	Project first cost	Interest during construction	Productivity loss during construction	Gross investment	Net salvage value	Net investment	Interest on investment	Amorti- zation of invest- ment	Loss of produc- tivity	Operation, maintenance, replacement	Total annual charges
I-14	\$6,640,000	\$199,200	\$4,400	\$6,844,000	\$498,000	\$6,346,000	\$205,300	\$10,500	\$4,400	\$ 76,000	\$312,700
I-15A	6,950,000	208,500	2,500	7,161,000	242,000	6,919,000	214,800	11,400	2,500	85,000	320,300
I-21	3,440,000	103,200	2,900	3,546,000	107,000	3,439,000	106,400	5,700	2,900	29,000	145,900
I-23	4,870,000	146,100	3,000	5,019,000	208,000	4,811,000	150,600	7,900	3,000	97,000	264,500
I-26	4,280,000	128,400	1,500	4,410,000	78,000	4,332,000	132,300	7,100	1,500	58,000	202,300
I-28	4,780,000	143,400	9,100	4,932,000	299,000	4,633,000	148,000	7,600	9,100	91,000	259,800
I-30	3,540,000	106,200	2,200	3,648,000	116,000	3,532,000	109,400	5,800	2,200	87,000	207,200
I-32	4,410,000	132,300	8,400	4,551,000	318,000	4,233,000	136,500	7,000	8,400	84,000	241,400
I-33A	5,150,000	154,500	3,700	5,308,000	163,000	5,145,000	159,200	8,500	3,700	71,000	245,900
I-35A	5,200,000	156,000	5,600	5,362,000	185,000	5,177,000	160,900	8,500	5,600	73,000	250,600
I-38	5,610,000	168,300	7,800	5,786,000	308,000	5,478,000	173,600	9,000	7,800	148,000	343,800
I-41	3,680,000	110,400	1,800	3,792,000	60,000	3,732,000	113,800	6,200	1,800	30,000	152,800

TABLE T-57
Allocated costs - headwater reservoirs

<u>Reservoirs</u>	<u>Flood control</u>	<u>Total recreation</u>	<u>Area reorientation</u>	<u>Total</u>
H-3				
Average annual charges (financial cost)	\$ 8,600	\$ 12,600	\$ 6,600	\$ 27,800
Total project cost	173,000	136,000	110,000	419,000
Annual O&M costs	3,100	8,300	3,100	14,500
H-4				
Average annual charges (financial cost)	-	20,800	16,500	37,300
Total project cost	-	338,000	402,000	740,000
Annual O&M costs	-	10,100	3,800	13,900
H-5A				
Average annual charges (financial cost)	11,100	11,200	2,700	25,000
Total project cost	148,000	129,000	85,000	362,000
Annual O&M costs	6,400	7,100	-	13,500
H-6				
Average annual charges (financial cost)	-	26,400	18,200	44,600
Total project cost	-	325,000	505,000	830,000
Annual O&M costs	-	16,100	2,200	18,300
H-8				
Average annual charges (financial cost)	12,500	22,500	15,200	50,200
Total project costs	309,000	313,000	398,000	1,020,000
Annual O&M costs	2,700	12,600	2,600	17,900
H-9				
Average annual charges (financial cost)	10,600	11,000	6,300	27,900
Total project cost	263,000	161,000	142,000	566,000
Annual O&M costs	2,300	5,900	1,800	10,000
H-11A				
Average annual charges (financial cost)	6,600	13,400	7,600	27,600
Total project cost	120,000	129,000	130,000	379,000
Annual O&M costs	2,800	9,300	3,500	15,600

TABLE T-57 (Cont'd)

<u>Reservoirs</u>	<u>Flood control</u>	<u>Total recreation</u>	<u>Area reorientation</u>	<u>Total</u>
H-13A				
Average annual charges (financial cost)	\$ 14,500	\$ 15,500	\$ 10,400	\$ 40,400
Total project cost	366,000	164,000	231,000	761,000
Annual O&M costs	2,900	10,300	3,100	16,300
H-25				
Average annual charges (financial cost)	2,900	15,000	9,700	27,600
Total project cost	54,000	270,000	247,000	571,000
Annual O&M costs	1,200	6,500	1,900	9,600

Note: . Of the 12 reservoirs, 3 either did not have a favorable over-all benefit-cost ratio or did not have all individual purposes justified. Since one of the criterion in selection of reservoir sites is that it should permit complete development, the 3 reservoirs were not investigated further, pending a determination of the ability of the 21 reservoirs to meet the immediate and near future water needs of the basin.

TABLE T-58
Average annual charges - economic costs (100-year amortization period)
Headwater reservoirs

Reser- voir	Project first cost	Interest during construc- tion	Productivity loss during construction	Gross investment	Net salvage value	Net investment	Interest on investment	Amorti- zation of invest- ment	Loss of produc- tivity	Operation, maintenance, replacement	Total annual charges
H-3	\$ 419,000	-	-	\$ 419,000	\$ 69,000	\$350,000	\$12,600	\$ 600	\$2,900	\$14,500	\$29,600
H-4	740,000	-	-	740,000	78,000	662,000	22,200	1,100	3,300	13,900	39,300
H-5A	362,000	-	-	362,000	37,000	325,000	10,900	500	1,500	13,500	25,900
H-6	830,000	-	-	830,000	116,000	714,000	24,900	1,200	4,900	18,300	47,600
H-8	1,020,000	-	-	1,020,000	137,000	883,000	30,600	1,500	5,700	17,900	53,700
H-9	566,000	-	-	566,000	62,000	504,000	17,000	800	2,600	10,000	29,500
H-10	488,000	-	-	488,000	36,000	452,000	14,600	700	1,400	9,100	25,300
H-11	379,000	-	-	379,000	87,000	292,000	11,400	500	3,600	15,600	29,900
H-13A	761,000	-	-	761,000	129,000	632,000	22,800	1,000	5,300	16,300	43,600
H-25	571,000	-	-	571,000	168,000	403,000	17,100	700	3,100	9,600	29,400
H-31	530,000	-	-	530,000	49,000	481,000	15,900	800	2,100	6,600	25,400
H-40	504,000	-	-	504,000	60,000	444,000	15,100	700	2,500	14,700	33,000

TABLE T-59
Allocated costs and annual charges - local protection projects

Levee area	Degree of protection provided	Economic life	Project costs (\$)			Economic annual charges				
			Federal	Non-Federal	Total	Federal interest and amortization	Non-Federal interest and amortization	Loss of productivity	Subtotal	Total
No. 2, Telegraph Road	50-year	50-year	\$2,280,000	\$ 237,000	\$ 2,517,000	\$ 88,600	\$ 9,200	\$ 23,000	\$ 34,300	\$122,900
No. 4, Starling Airport	50-year	50-year	2,350,000	378,000	2,728,000	91,300	14,700	20,000	1,700	127,700
No. 5, Butler Lakes	50-year	50-year	3,230,000	339,000	3,569,000	125,600	13,200	46,000	2,800	187,600
No. 7, Fenton	200-year	100-year	1,220,000	674,000	1,894,000	38,600	21,300	9,000	2,200	71,100
No. 8, West Watson Road	200-year	100-year	698,000	193,000	891,000	22,100	6,100	6,000	800	35,000
No. 9, Weiss Airport	200-year	100-year	1,430,000	220,000	1,650,000	45,300	7,000	16,000	1,400	69,700
No. 11, Valley Park	200-year	100-year	1,350,000	289,000	1,639,000	42,700	9,100	11,000	3,100	65,900
No. 12, Peerless Park	200-year	100-year	1,910,000	383,000	2,293,000	60,500	12,100	30,000	1,900	104,500
No. 17, Fox Creek	50-year	50-year	1,300,000	207,000	1,507,000	50,500	8,000	14,000	700	73,200
Total			\$15,768,000	\$2,920,000	\$18,688,000	\$565,200			\$292,400	\$857,600

TABLE T-60
Allocated costs and annual charges - angler-use sites

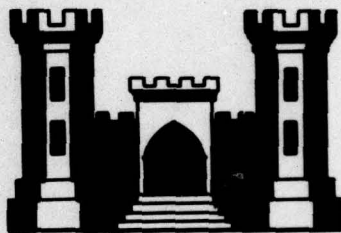
Controlling reservoir	Site designation	Type of access	Name	Project** first costs	Economic annual charges**		
					Federal	Non-Federal Total	
BIG RIVER SUB-BASIN	Irondale (9)	A *	Highway 8				
		B Boat only	Terre Bleue Creek				
		C *	Highway E				
		D *	Washington Park	\$117,000	\$ 4,500	\$16,300	\$ 20,800
Pine Ford (2A)	E Boat only	Morse Mill					
	F *	Island					
	G *	Cedar Hill					
	H *	Rockford Beach					
	I Boat only	Meramec River confluence	134,000	5,200	19,500	24,700	
MERAMEC RIVER SUB-BASIN	Salem (27)	J Boat only	Wesco				
		K *	Benton Creek				
		L *	Highway 8	84,000	3,300	8,500	11,800
I-28 and/or Salem (27) (below Meramec Spring)	M Boat only	1,000 Oaks					
	N *	Idlewild					
	O *	Highway 19	84,000	3,300	8,600	11,900	
Meramec Park (17)	P *	Cove Church					
	Q Boat only	Little Meramec River					
	R *	Robertsville	84,000	3,300	13,000	16,300	
I-26 and/or I-14	S Boat only	Huzzah	50,000	1,900	5,300	7,200	
	T *	Highway 8					

TABLE T-60 (Cont'd)

<u>Controlling reservoir</u>	<u>Site designation</u>	<u>Type of access</u>	<u>Name</u>	<u>Project** first costs</u>	<u>Economic annual charges**</u>		
					<u>Federal</u>	<u>Non-Federal</u>	<u>Total</u>
I-15A	U	*	Highway 8				
	V	Boat only	Doss Branch	\$ 50,000	\$ 1,900	\$ 5,500	\$ 7,400
BOURBEUSE RIVER SUB-BASIN							
Union (29)	W	*	Beuscher Creek				
	X	*	Highway 50				
	Y	*	Highway 66				
	Z	Boat only	Meramec River confluence				
				<u>117,000</u>	<u>4,500</u>	<u>16,500</u>	<u>21,000</u>
Total				\$720,000	\$27,900	\$93,200	\$121,100

*Road and boat access.

**All angler-use sites below a reservoir analyzed as a total combined system. Total project first cost would be Federal; operation and maintenance costs, including replacement, would be a non-Federal expense.



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